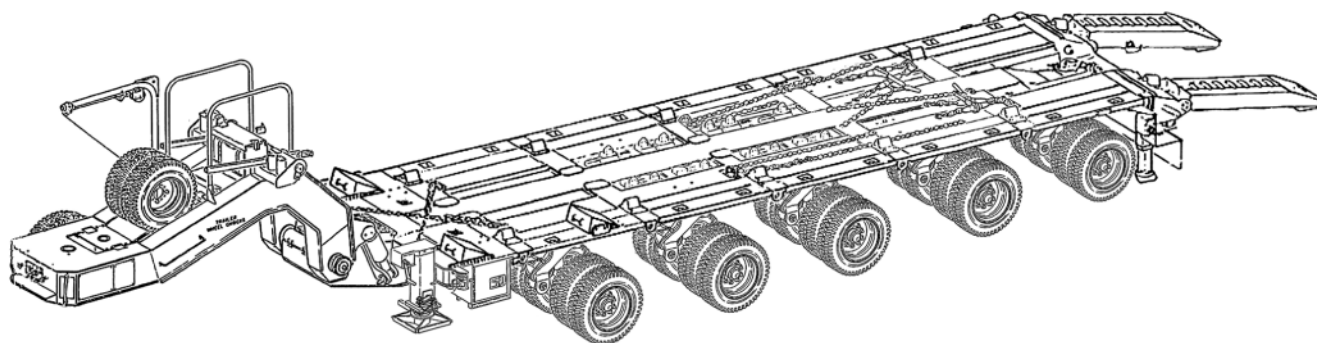


TECHNICAL MANUAL
OPERATOR AND FIELD MAINTENANCE MANUAL
FOR
SEMITRAILER, TRANSPORTER, HEAVY EQUIPMENT
70 TON, M1000
NSN 2330-01-303-8832 (EIC: CXU)



DISTRIBUTION STATEMENT A – Approved for public release, distribution is unlimited.

HEADQUARTERS, DEPARTMENT OF THE ARMY
OCTOBER 2009

WARNING SUMMARY

INTRODUCTION

This warning summary contains general safety warnings and hazardous material warnings that must be understood and applied during operation and maintenance of this equipment. Failure to observe these precautions could result in serious injury or death to personnel. Also included are explanations of safety and hazardous material icons used within the technical manual.

FIRST AID

First aid can be defined as “urgent and immediate lifesaving and other measures, which can be performed for casualties by nonmedical personnel when medical personnel are not immediately available.” For first aid, refer to FM 4-25.11, First Aid.

WARNING SUMMARY - CONTINUED

EXPLANATION OF SAFETY WARNING ICONS



EAR PROTECTION – Headphones over ears shows that noise level will harm ears.



ELECTRICAL – Electrical wire to arm with electricity symbol running through human body shows that shock hazard is present.



ELECTRICAL – Electrical wire to hand with electricity symbol running through hand shows that shock hazard is present.



FALLING PARTS – Arrow bouncing off human shoulder and head shows that falling parts present a danger to life or limb.



FLYING PARTICLES – Arrows bouncing off face shows that particles flying through the air will harm face.



FLYING PARTICLES – Arrows bouncing off face with face shield shows that particles flying through the air will harm face.



HEAVY OBJECT – Human figure stooping over heavy object shows physical injury potential from improper lifting technique.



HEAVY PARTS – Hand with heavy object on top shows that heavy parts can crush and harm.



HEAVY PARTS – Foot with heavy object on top shows that heavy parts can crush and harm.

WARNING SUMMARY - CONTINUED



HEAVY PARTS – Heavy object on human figure shows that heavy parts present a danger to life or limb.



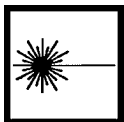
HEAVY PARTS – Heavy object pinning human figure against wall shows that heavy, moving parts present a danger to life or limb.



HELMET PROTECTION – Arrow bouncing off head with helmet shows that falling parts present a danger.



HOT AREA – Hand over object radiating heat shows that part is hot and can burn.



LASER LIGHT – Laser light hazard symbol indicates extreme danger for eyes from laser beams and reflections.



MOVING PARTS – Human figure with an arm caught between gears shows that the moving parts of the equipment present a danger to life or limb.



MOVING PARTS – Hand with fingers caught between gears shows that the moving parts of the equipment present a danger to life or limb.



MOVING PARTS – Hand with fingers caught between rollers shows that the moving parts of the equipment present a danger to life or limb.



SHARP OBJECT – Pointed object in hand shows that a sharp object presents a danger to limb.



SHARP OBJECT – Pointed object in hand shows that a sharp object presents a danger to limb.

WARNING SUMMARY - CONTINUED



SHARP OBJECT – Pointed object in foot shows that a sharp object presents a danger to limb.



SLICK FLOOR – Wavy line on floor with legs prone shows that slick floor presents a danger for falling.

GENERAL SAFETY WARNINGS DESCRIPTION

WARNING

If injury occurs, obtain medical care immediately. Extreme heat, humidity, and contact with hydraulic fluids can cause infection, even from a light cut or scratch. For first aid, refer to FM 21-11.

WARNING



DO NOT wear watches, rings, or other jewelry that could cause a short in battery terminal while servicing battery. Failure to follow this warning may result in injury to personnel.



Always disconnect negative (black) cable first, and connect negative (black) cable last. Failure to follow this warning may result in injury to personnel.

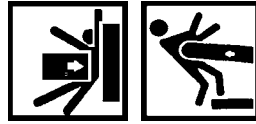


Many of the assemblies and components of the semitrailer are heavy. Always use the required number of personnel and appropriate lifting supporting devices as specified in the initial setup. Failure to follow this warning may result in injury to personnel.

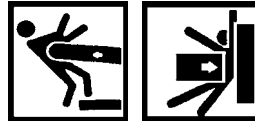


When on top of the gooseneck, always hold onto semitrailer with one hand to avoid falling. Failure to follow this warning may result in injury to personnel.

WARNING SUMMARY - CONTINUED



Two personnel are required for coupling. During hookup, the operator of the tractor must know the position of the spotter at all times. Failure to follow this warning may result in injury to personnel.



All spotters and ground personnel around the tractor/semitrailer must stand clear of the vehicles during uncoupling. Failure to follow this warning may result in injury to personnel.



Ensure the person who is adjusting the steering wedge adjusting nut is clear when the steering wedge is cycled back and forth. Failure to follow this warning may result in injury to personnel.



Prior to adjusting gooseneck height, pull out both gooseneck isolation and suspension SHUTOFF valve handles to the ADJUST position. Failure to follow this warning may result in injury to personnel.



Prior to moving the tractor from under the gooseneck, place the gooseneck isolation valve handle in the ADJUST position, handle pulled outward. Failure to follow this warning may result in injury to personnel.



DO NOT uncouple tractor/semitrailer if tractor has less than normal operating air pressure, approximately 100 to 120 psi (689.5 to 827 kPa), or the semitrailer will not have sufficient air pressure to apply or release brakes. Failure to follow this warning may result in injury to personnel.

WARNING SUMMARY - CONTINUED



DO NOT uncouple a loaded semitrailer from the tractor for purposes of performing maintenance tasks on the semitrailer. Failure to follow this warning may result in injury to personnel.



If the semitrailer is uncoupled from the tractor, and the gooseneck needs adjusting, verify that the front support legs are lowered and supporting the platform. Failure to follow this warning may result in injury to personnel.



If the semitrailer is uncoupled from the tractor, and the gooseneck needs adjusting, ensure that both gooseneck isolation and suspension shutoff valve handles have been pulled outward to the ADJUST position. Failure to follow this warning may result in injury to personnel.



If the semitrailer is uncoupled from the tractor, ensure both streetside and curbside front bogie wheels of the semitrailer are chocked. After the parking brakes are released, the semitrailer may roll uncontrolled. Failure to follow this warning may result in injury to personnel.



If the semitrailer is coupled to a tractor, pull the suspension shutoff and gooseneck isolation valve handles outward to the ADJUST position and uncouple the semitrailer. Failure to follow this warning may result in injury to personnel.



If the semitrailer is coupled to a tractor, the gooseneck isolation valve handle must be in the RUN position, handle pushed in. If the semitrailer is uncoupled, and the gooseneck needs adjusting, verify that front support legs are lowered and supporting the platform and that all personnel are clear of the gooseneck before operating the gooseneck isolation valve. Failure to follow this warning may result in injury to personnel.

WARNING SUMMARY - CONTINUED



Before performing any maintenance on the platform, lower the front and rear support legs. Failure to follow this warning may result in injury to personnel.



When lowering the support legs, ensure that feet and hands are clear of the support leg feet as they near the ground. Failure to follow this warning may result in injury to personnel.



When lowering or raising the front support legs, always install the retaining pins. Failure to follow this warning may result in injury to personnel.

Unlike conventional semitrailers, this semitrailer tracks the same turning radius as the M1070 tractor and does not cut the inside turning radius. When making turns, the operator needs to make tighter turns to keep the semitrailer from hitting the outer curb. Failure to follow this warning may result in injury to personnel.

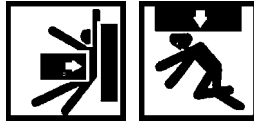
Using the M911 or M1070 tractor, the semitrailer will not back like a normal semitrailer because of the semitrailer's steering system. The operator must back tractor/semitrailer by turning tractor steering wheel in opposite direction of what would be used for backing with a normal semitrailer. Failure to follow this warning may result in injury to personnel.

Because of minor loading ability while driving with a disabled bogie, especially when carrying a payload, turning speeds must be reduced to 85 percent of the maximum safe turning speeds. Example: A 15 mph (24 kph) maximum turn speed should be reduced to 13 mph (21 kph) maximum turn speed. Failure to follow this warning may result in injury to personnel.

When manually steering the semitrailer, make many starts and stops to give spotter time to adjust steering. The tractor operator should allow even space on both sides of the tractor so that the spotter steering the semitrailer has room to make adjustments. Failure to follow this warning may result in injury to personnel.

Precaution must be exercised during highway travel to ensure that all bridges and underpasses can be negotiated. Failure to follow this warning may result in injury to personnel.

WARNING SUMMARY - CONTINUED



When towing a payload, check security of load and tighten tiedowns at every rest and maintenance stop. Failure to follow this warning may result in injury to personnel.

DO NOT under any circumstances exceed the following speeds: Highway 45 mph (72 km/h), Secondary 40 mph (64 km/h), and Off-road 15 mph (24 km/h). Failure to follow this warning may result in injury to personnel.

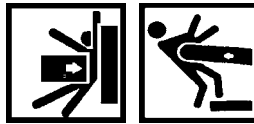
DO NOT enter water at more than walking speed of 5 mph (8 kph) with an entrance or exit slope of more than 15 percent. Failure to follow this warning may result in injury to personnel.

DO NOT enter water deeper than 28 in. (71 cm), including wave height. Failure to follow this warning may result in injury to personnel.

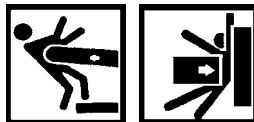
DO NOT enter water that has ice or debris on the surface. Failure to follow this warning may result in injury to personnel.

Always check the stream bottom to determine that it is firm enough to support the semitrailer and that there are no obstacles under water. Failure to follow this warning may result in injury to personnel.

DO NOT enter water that has a current velocity of more than 5 mph (8 kph). This is equivalent to 7 ft per second (2 m/s). Failure to follow this warning may result in injury to personnel.

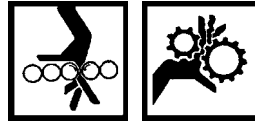


When the ramp stow chains are disconnected from the platform, DO NOT stand behind the ramps or near the path the ramps can travel when being lowered or raised. Failure to follow this warning may result in injury to personnel.

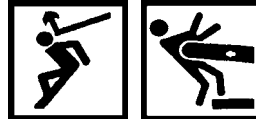


The spring-assisted ramps, when raised from the lowered position, are under extreme tension and raise very quickly. When raising ramps, DO NOT stand on the beavertail or in the path where any portion of the ramp will travel during upward travel. Failure to follow this warning may result in injury to personnel.

WARNING SUMMARY - CONTINUED



When ramps are lowered and near the horizontal position, the springs are fully compressed and under extreme pressure. **DO NOT** attempt to adjust or remove the spring mechanism unless ramps are in the raised (stow) position. Failure to follow this warning may result in injury to personnel.



If possible, provide ample clear space behind the disabled payload during loading/unloading in case the cables break while the payload is being loaded/unloaded. Failure to follow this warning may result in injury to personnel.



Ensure all ground personnel stand clear of winch cables except when handling the cables. Failure to follow this warning may result in injury to personnel.

Ensure winch cables are not kinked, clevises are secured to winch cables, and snatch blocks and shackles are in good condition and properly secured. Failure to follow this warning may result in injury to personnel.

Ensure winch cables are inspected in accordance with TB 43-0142. Failure to follow this warning may result in injury to personnel.

Exercise extreme caution during any operation on a slope. Failure to follow this warning may result in injury to personnel.



A ground spotter must stand curbside of the semitrailer and maintain visual contact with the winch operator. The spotter must observe cables, snatch blocks, shackles, and payload position during loading/unloading operations. Failure to follow this warning may result in injury to personnel.

WARNING SUMMARY - CONTINUED



During winch-on operations on a downgrade, the payload must be restrained from the rear with some other vehicle to prevent possible loss of control of the payload. Failure to follow this warning may result in injury to personnel.

DO NOT overload tractor winches. Know the rating of the winches being used and be aware of any protection devices (such as shear pins). Failure to follow this warning may result in injury to personnel.



DO NOT stand on the semitrailer platform. At no time during any loading/unloading operations while the payload is being pulled on and/or off with winches should personnel be on the semitrailer platform. Failure to follow this warning may result in injury to personnel.



Two spotters are required for able payload loading/unloading operations. The payload operator must know the position of spotters at all times. Failure to follow this warning may result in injury to personnel.



DO NOT position a spotter on the gooseneck if the payload is to be backed onto the semitrailer platform. Failure to follow this warning may result in injury to personnel.



Always wear leather gloves when handling cable. Never allow cable to run through hands. Failure to follow this warning may result in injury to personnel.



A spotter is required for disabled payload loading/unloading operations. The winch operator must maintain visual contact with the spotter at all times. Failure to follow this warning may result in injury to personnel.

WARNING SUMMARY - CONTINUED



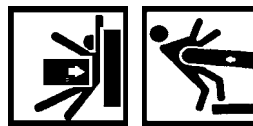
Whenever possible, load/unload the semitrailer on level ground. In adverse conditions, loading/unloading can be done on grades up to 10 percent with a maximum offset angle of 10 degrees between tractor and semitrailer. Avoid exceeding these limitations to prevent payload from rolling on/off semitrailer. Failure to follow this warning may result in injury to personnel.

Due to semitrailers being outfitted with various chain link sizes, 1/2 in. (1.27 cm) and/or 3/4 in. (1.9 cm), all chains must be inventoried in the platform storage compartment prior to placing chains on the platform. Once chains are inventoried, read and become familiar with the procedures to determine tiedown needed to properly secure the payload. Failure to follow this warning may result in injury to personnel.

Winch operator and spotter must be completely familiar with the sequence of steps prior to using winches. Failure to follow this warning may result in injury to personnel.



Unnecessary personnel must stand well clear of the vehicles, especially behind the payload (engine/turbine exhaust) during loading/unloading operations. At no time during any loading/unloading operation while the payload is moving should personnel be on the semitrailer platform. The payload operator must drive the payload slowly up or down the loading ramps and onto the platform or ground. Failure to follow this warning may result in injury to personnel.



Failure to extend the safety rail while attaching or removing payload winch cable may cause injury to personnel. Failure to follow this warning may result in injury to personnel.

DO NOT disconnect the winch cable until the platform is level and the payload is chocked. Failure to follow this warning may result in injury to personnel.



Use extreme caution when removing winch cables from the payload. Cable may be under tension or may be twisted. If winch cable has tension when removed, slowly and carefully, using both hands, rotate cable to relieve tension. DO NOT allow cable to twist or whip freely. Failure to follow this warning may result in injury to personnel.

WARNING SUMMARY - CONTINUED



Ensure the winch cable is disconnected from gooseneck fairlead before moving tractor/semitrailer combination, or as the combination is moved, the winch cable may stretch and/or break. Failure to follow this warning may result in injury to personnel.

Winch operator must try to maintain even tension on both winch cables during entire off-loading procedure. Payload adjustments and side-to-side turning must be kept to a minimum. Spotter must notify winch operator of any required payload adjustments while unloading. Failure to follow this warning may result in injury to personnel.



Before performing lubrication procedures on the semitrailer, raise platform to highest position; lower front and rear support legs; and close all isolation valves. Failure to follow this warning may result in injury to personnel.



Drain air system prior to disconnecting pneumatic lines to prevent inadvertent operation of the semitrailer brake valve during platform adjustments. Failure to follow this warning may result in injury to personnel.



Steering and suspension system hydraulic lines are under pressure even when Auxiliary Power Unit (APU) is not running. DO NOT attempt to tighten, loosen, adjust, or repair fitting, line, or hoses until the semitrailer is supported by support legs and all pressure is relieved. Failure to follow this warning may result in injury to personnel.



Use the gooseneck support prior to removing any hydraulic hoses from either of the gooseneck cylinders, or the gooseneck may fall. Failure to follow this warning may result in injury to personnel.

WARNING SUMMARY - CONTINUED



Prior to bleeding steering cylinders, lower all four support legs to support the platform. Failure to follow this warning may result in injury to personnel.



The air filter assembly has an internal spring that, when assembled, is under pressure. Use caution when removing the housing nut. Failure to follow this warning may result in injury to personnel.



Ensure all four support legs are lowered and supporting the platform before operating the gooseneck isolation valve or any suspension isolation valve. Failure to follow this warning may result in injury to personnel.



Prior to inspection, if the platform was raised, no one shall go under the semitrailer unless all suspension isolation valves have been closed. Failure to follow this warning may result in injury to personnel.



Personnel used to remove/maneuver the axle or parking brake chamber must not at any time use the caging bolt as a holding lifting device. The caging bolt is held in place by pressure from a spring in the brake chamber. Failure to follow this warning may result in injury to personnel.



Hearing protection is required within 10 ft (3.1 m) of the Auxiliary Power Unit (APU) when the APU is running. Use eye and ear protection and protective gloves when inspecting the APU while it is running, or injury could result from moving parts, excessive noise level, and engine heat. Failure to follow this warning may result in injury to personnel.

WARNING SUMMARY - CONTINUED



When checking for leaks, never open any type of fluid-holding tanks during operation or while the APU is under pressure. Give the systems time to cool before attempting to make any fluid checks or severe burns from the spraying of hot fluids may result. Failure to follow this warning may result in injury to personnel.



Remove all jewelry such as rings, dog tags, bracelets, etc., when jump-starting the APU. Wearing jewelry may result in electrical shock. Failure to follow this warning may result in injury to personnel.



Ensure that vented dummy coupling is installed on the emergency (red) gladhand prior to releasing brakes with the brake release valve. If a nonvented dummy coupling is installed, the parking brakes cannot be reapplied and injury to personnel may result. Failure to follow this warning may result in injury to personnel.



On some semitrailers a solar battery charger is mounted to the top of the gooseneck directly in front of spare tires. Persons working on top of the gooseneck must take **EXTREME** care not to step on it or trip over it. Failure to follow this warning may result in injury to personnel.

Always use a snap-on chuck, an extension air hose, 10 ft (3.1 m) minimum, and an in-line pneumatic tire inflator gauge. Stay out of the sidewall trajectory area when inflating tires that are mounted on the M1000 semitrailer. Failure to follow this warning may result in injury to personnel.

Always follow proper tire insulation procedures and warnings. Failure to follow this warning may result in injury to personnel.

Before breaking tire bead, ensure no air pressure remains in tire. Failure to follow this warning may result in injury to personnel.

DO NOT use retread tires on the M1000 semitrailer. Only tires listed in TM 9-2330-381-24P, Repair Parts and Special Tools List (RPSTL), are authorized for use. Failure to follow this warning may result in tire failure and injury to personnel.

WARNING SUMMARY - CONTINUED



Tires may explode. Place wheel and tire in safety cage before inflating. Stay back at least 10 ft (3.1 m) from cage when inflating tire. Always stay out of the trajectory area. Always use an air hose extension, 10 ft (3.1 m) minimum, a snap-on chuck, and an in-line inflator gauge. Failure to follow this warning may result in injury to personnel.



When wheel/tire assembly is in safety cage, DO NOT lean against, stand on, or reach over or in the cage. Failure to follow this warning may result in injury to personnel.

Never inflate tire over 40 psi (276 kPa) to seat bead. If beads DO NOT seat, deflate, demount, and check the tire/wheel match. Failure to follow this warning may result in injury to personnel.



Hydraulic fluid may be hot if system has been in operation. Allow system to cool before performing maintenance. Failure to follow this warning may result in injury to personnel.

WARNING SUMMARY - CONTINUED

EXPLANATION OF HAZARDOUS MATERIALS ICONS



BIOLOGICAL – Abstract symbol bug shows that a material may contain bacteria or viruses that present a danger to life or health.



CHEMICAL – Drops of liquid on hand shows that the material will cause burns or irritation to human skin or tissue.



CRYOGENIC – Hand in block of ice shows that the material is extremely cold and can injure human skin or tissue.



EXPLOSION – Rapidly expanding symbol shows that the material may explode if subjected to high temperatures, sources of ignition, or high pressure.



EYE PROTECTION – Person with goggles shows that the material will injure the eyes.



FIRE – Flames shows that a material may ignite and cause burns.



POISON – Skull and crossbones shows that a material is poisonous or is a danger to life.



RADIATION – Three circular wedges shows that the material emits radioactive energy and can injure human tissue.



VAPOR – Human figure in a cloud shows that material vapors present a danger to life or health.

WARNING SUMMARY - CONTINUED

WARNING



The battery contains sulfuric acid, which may cause severe eye injury, skin burns, and damage to clothing. Wear eye protection and protective clothing and avoid spilling any acid. If contact occurs, flush affected areas immediately with large quantities of water and seek medical attention. Failure to follow this warning may result in injury to personnel.

WARNING



The battery gives off hydrogen gas, which is explosive. DO NOT smoke or allow any flames in the vicinity while checking or filling the battery. Failure to follow this warning may result in injury to personnel.

WARNING



A frozen or completely discharged battery can explode if power is applied. Before connecting any form of external power to the battery, ensure frozen battery is warmed, or discharged battery is replaced. Failure to follow this warning may result in injury to personnel.

WARNING



Welding and brazing operations produce heat, toxic fumes, radiation, metal slag, and carbon particles. Welding and brazing goggles with properly tinted lenses are required. Also required are gloves, apron, and welding boots. Failure to follow this warning may result in injury to personnel.

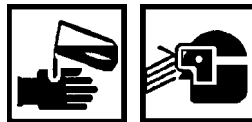
WARNING SUMMARY - CONTINUED

WARNING



Always wear safety goggles when using compressed air to prevent dirt and debris from entering your eyes. Compressed air stream must be less than 30 psi (207 kPa). Failure to follow this warning may result in injury to personnel.

WARNING



Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets in eyes, flush eyes immediately with water and seek medical attention. If hydraulic fluid gets on skin, wash thoroughly with soap and water. Wash hands thoroughly prior to eating or smoking. Failure to follow this warning may result in injury to personnel.

WARNING



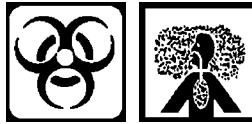
Residual pressure may remain in hydraulic lines. Open fittings slowly. Failure to follow this warning may result in injury to personnel.

WARNING SUMMARY - CONTINUED**WARNING****SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
 - The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
 - Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
 - Fire extinguishers should be placed nearby when using solvent cleaning compound.
 - Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
 - Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.
- Failure to follow these warnings may result in serious injury or death to personnel.

WARNING SUMMARY - CONTINUED

WARNING



If Nuclear, Biological, and Chemical (NBC) exposure is suspected, all air filter media should be handled by personnel wearing protective equipment. Consult your unit NBC Officer or NBC NCO for appropriate handling or disposal instructions. Failure to follow this warning may result in injury to personnel.

WARNING



Compressed air used for cleaning/drying creates airborne particles that may injure the eyes. Always wear eye protection. Pressure must not exceed 30 psi (207 kPa). Failure to follow this warning may result in injury to personnel.

WARNING



Technical alcohol is used to clean parts and is potentially dangerous to personnel and property. Extinguish all smoking materials and DO NOT allow sparks or open flames near work area. Use skin and eye protection and work in a well-ventilated area. Failure to follow this warning may result in injury to personnel.

WARNING



Cleaning compound solvent is used to clean parts and is potentially dangerous to personnel. Extinguish all smoking materials and DO NOT allow sparks or open flame near the work area. Use skin and eye protection and work in a well-ventilated area. Failure to follow this warning may result in injury to personnel.

WARNING SUMMARY - CONTINUED



Diesel fuel is combustible and is an irritant to the eyes, skin, and respiratory system. To avoid explosion and injury to personnel, extinguish all smoking materials and **DO NOT** allow sparks or open flame near the fuel tank or the fuel system. Use skin and eye protection and work in a well-ventilated area. Failure to follow this warning may result in injury to personnel.

WARNING



Clean up fuel that spilled during fuel line removal. Failure to follow this warning may result in injury to personnel.

WARNING



Fluorescent penetrant may cause injury to personnel. Avoid skin contact. In case of skin contact, wash with warm water and soap. Failure to follow this warning may result in injury to personnel.

WARNING



Soldering fumes are toxic. Avoid breathing these fumes. Work in a well-ventilated area. Failure to follow this warning may result in injury to personnel.

LIST OF EFFECTIVE PAGES/WORK PACKAGES

NOTE: The portion of text affected by the change is indicated by a vertical bar in the outer margins of the page. Changes to illustrations are indicated by a vertical bar adjacent to the title. Zero in the "Change No." column indicates an original page or work package.

Date of issue for original manual is:

Original 30 October 2009

THE TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS 170 AND THE TOTAL NUMBER OF WORK PACKAGES IN THIS MANUAL IS 61, CONSISTING OF THE FOLLOWING:

Page/ WP	Change	Page/WP	Change
Front Cover	0	Blank	0
Blank	0	WP0028 (2 pgs)	0
Warning Summary (22 pgs)	0	WP0029 (10 pgs)	0
Title block	0	WP0030 (16 pgs)	0
Blank	0	WP0031 (6 pgs)	0
iii-xxxiii (22 pgs)	0	WP0032 (2 pgs)	0
xxiv Blank	0	WP0033 (2 pgs)	0
Chapter 1 title page	0	Chapter 4 title page	0
Blank	0	Blank	0
WP0001 (4 pgs)	0	WP0034 (4 pgs)	0
WP0002 (12 pgs)	0	WP0035 (70 pgs)	0
WP0003 (2 pgs)	0	Chapter 5 title page	0
Chapter 2 title page	0	Blank	0
Blank	0	WP0036 (14 pgs)	0
WP0004 (14 pgs)	0	WP0037 (6 pgs)	0
WP0005 (10 pgs)	0	WP0038 (6 pgs)	0
WP0006 (2 pgs)	0	WP0039 (6 pgs)	0
WP0007 (4 pgs)	0	WP0040 (6 pgs)	0
WP0008 (8 pgs)	0	WP0041 (8 pgs)	0
WP0009 (8 pgs)	0	WP0042 (14 pgs)	0
WP0010 (6 pgs)	0	WP0043 (6 pgs)	0
WP0011 (6 pgs)	0	WP0044 (2 pgs)	0
WP0012 (6 pgs)	0	WP0045 (8 pgs)	0
WP0013 (16 pgs)	0	WP0046 (4 pgs)	0
WP0014 (6 pgs)	0	WP0047 (6 pgs)	0
WP0015 (24 pgs)	0	WP0048 (4 pgs)	0
WP0016 (14 pgs)	0	WP0049 (4 pgs)	0
WP0017 (28 pgs)	0	WP0050 (6 pgs)	0
WP0018 (36 pgs)	0	WP0051 (6 pgs)	0
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HEADQUARTERS DEPARTMENT OF THE ARMY
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**TECHNICAL MANUAL
OPERATOR AND FIELD MAINTENANCE MANUAL
FOR
SEMITRAILER, TRANSPORTER, HEAVY EQUIPMENT
70 TON, M1000
NSN 2330-01-303-8832 (EIC: CXU)
CURRENT AS OF 30 October 2009**

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HOW TO USE THIS MANUAL

HOW TO USE THIS MANUAL

This manual provides general information, operator instructions, and maintenance procedures for the Heavy Equipment Transporter (HET) semitrailer.

Before starting any task/procedure, make sure you have read this HOW TO USE section and the Controls and Indicators in WP 0004.

A Warning Summary appears at the beginning of this manual. The WARNING SUMMARY section provides safety and first aid information. These warnings are repeated at appropriate points throughout the manual. Become familiar with these warnings before using or performing maintenance on the HET semitrailer. All of these warnings cover hazards that could injure or kill personnel.

This manual is divided into chapters representing main categories of information (e.g., General Information, Equipment Description, and Theory of Operation; Operator Instructions; and Troubleshooting Procedures).

Each chapter is divided into work packages, which are identified by a four-digit number (e.g., 0001, 0002) printed in the upper right corner of each page.

The Table of Contents at the front of the manual lists all chapters and work packages by title. There is also an alphabetical subject Index at the back of the manual to enable you to quickly locate specific information by topic.

This manual contains standard maintenance procedures as well as Preventive Maintenance Checks and Services (PMCS) and troubleshooting procedures. If the HET semitrailer needs repair, but you are not sure what is wrong or how to fix it, refer to the Troubleshooting Index in Chapter 3. Identify the malfunction, locate it in the Troubleshooting Index, and then refer to the troubleshooting procedure indicated for that symptom. Perform the corresponding corrective actions in the order listed. If the malfunction is not listed in the troubleshooting table or it is not corrected by the corrective action listed, notify your supervisor.

The Supporting Information chapter includes a list of reference publications, a Maintenance Allocation Chart (MAC), Basic Issue Items (BII), and an Expendable and Durable Items List work package. These work packages supplement specific operation and maintenance information contained in this manual.

Take a few minutes to look through this manual. We have designed this manual to make it easier for you to find and perform the procedures needed.

CHAPTER 1

**GENERAL INFORMATION, EQUIPMENT DESCRIPTION AND THEORY OF
OPERATION**

FOR

SEMITRAILER, TRANSPORTER, HEAVY EQUIPMENT 70 TON, M1000

FIELD MAINTENANCE

GENERAL INFORMATION

SCOPE

This Operator and Field Maintenance Manual, including a Maintenance Allocation Chart (MAC), covers the use and maintenance of the M1000 Heavy Equipment Transporter (HET) semitrailer.

The purpose of the HET semitrailer is to load or unload and transport a battle-dressed M-1 series Main Battle Tank (MBT), able or disabled, with or without tracks, during administrative and tactical operations.

MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by (as applicable) DA PAM 738-750, The Army Maintenance Management System (TAMMS) Users Manual, or AR 700-138, Army Logistics Readiness and Sustainability.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

You can help improve this publication. If you find any errors, or if you would like to recommend any improvements to the procedures in this publication, please let us know. The preferred method is to submit your DA Form 2028 (Recommended Changes to Publications and Blank Forms) through the Internet, on the Army Electronic Product Support (AEPS) website. The internet address is <https://aeps.ria.army.mil>. The DA Form 2028 is located under the Public Applications section in the AEPS Public Home Page. Fill out the form and click on SUBMIT. Using this form on the AEPS will enable us to respond quicker to your comments and better manage the DA Form 2028 program. You may also mail, e-mail, or fax your comments or DA Form 2028 directly to the U.S. Army TACOM Life Cycle Management Command. The postal mail address is U.S. Army TACOM Life Cycle Management Command, ATTN: AMSTA-LC-LMPP / TECH PUBS, 1 Rock Island Arsenal, Rock Island, IL 61299-7630. The e-mail address is tacomlcmc.daform2028@us.army.mil. The fax number is DSN 793-0726. The commercial number is (309) 782-0726.

CORROSION PREVENTION AND CONTROL (CPC)

Corrosion Prevention and Control (CPC) of Army materiel is a continuing concern. It is important that any corrosion problem with this equipment be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items. Corrosion specifically occurs with metals. It is an electro-chemical process that causes the degradation of metals. It is commonly caused by exposure to moisture, acids, bases, or salts. An example is the rusting of iron. Corrosion damage in metals can be seen, depending on the metal, as tarnishing, pitting, fogging, surface residue, and/or cracking. Plastics, composites, and rubbers can also degrade. Degradation is caused by thermal (heat), oxidation (oxygen), solvation (solvents), or photolytic (light, typically UV) processes. The most common exposures are excessive heat or light. Damage from these processes will appear as cracking, softening, swelling, and/or breaking. SF Form 368, Product Quality Deficiency Report should be submitted to the address specified in DA PAM 738-750, The Army Maintenance Management System (TAMMS) Users Manual.

DESTRUCTION OF EQUIPMENT TO PREVENT ENEMY USE

Refer to TM 750-244-6, Procedures for Destruction of Tank Automotive Equipment to Prevent Enemy Use.

PREPARATION FOR STORAGE OR SHIPMENT

Administrative storage procedures shall be in accordance with TM 740-90-1, Administrative Storage of Equipment. The placement of the test set in administrative storage for short periods of time, up to six months, requires no special care or maintenance.

These procedures cover the processing of the semitrailer prior to storage or shipment to Level A or Level B as required. Determination of the level of protection required is made based on the following criteria:

Level A - Processing for domestic or overseas shipments and any storage outside of building in excess of 90 days from date of processing with periodic care and preservation during storage required.

PREPARATION FOR STORAGE OR SHIPMENT - CONT.

Level B - Limited processing for immediate shipment and use, domestic or overseas, excluding open-deck loading and for any storage not to exceed 90 days from date of processing.

Table 1. Storage and Shipment Materials.

ITEM	SPECIFICATION	DESCRIPTION
1	MIL-B-117	Bag, Type I, Class B, Style 2
2	MIL-B-121	Barrier material, grease proofed, waterproofed, flexible
3	PPP-B-636	Box, shipping fiberboard, Type CF, Grade W6C, Class WR, weather-resistant
4	PPP-P-291	Cushion, cardboard
5	PPP-B-601	Box, wood, nailed, Style 1, Grade B, Type 3, load size 63-1/2 in. x 24 in. x 13 in. with four lumber strips across width of box
6		Plywood, Grade CDX, 1/2 in. thick.
7	MIL-L-21260	Preservative oil, Grade PE 10-1
8	MIL-L-21260	Preservative oil, Grade 30
9	MIL-C-16173	Preservative oil, Grade 4
10	QQ-S-781	Strapping, steel and seals, Type I, Class I, Finish A, 1-1/4 in. wide, 0.031 in. thick
11	QQ-S-781	Strapping, steel and seals, Type I, Class I, Finish B, 3/4 in. wide, 0.035 in. thick
12	UU-T-81	Tag, shipping paper, Type B, Size 6
13	PPP-T-60	Tape, packaging waterproof, Type III, Class I
14	MIL-T-22087	Tape, packaging waterproof, Type II

LIST OF ACRONYMS/ABBREVIATIONS

Following is a list of acronyms and abbreviations contained in this manual.

Table 2. Acronyms and Abbreviations List.

A	After
A	Annually
AOAP	Army Oil Analysis Program
APU	Auxiliary Power Unit
B	Before
BII	Basic Issue Items
cm	Centimeter
CPC	Corrosion Prevention and Control
CTA	Common Table of Allowance
D	During
DR	Drive
ea	Each
EIR	Equipment Improvement Recommendation
ft	Feet
gal.	Gallon
GMAW	Gas Metal Arc Welding
GMTK	General Mechanic's Tool Kit
H	Hour
HET	Heavy Equipment Transporter
hp	Horsepower
Hz	Hertz
in.	Inches
ISO	International Standards Organization
kg	Kilogram
km	Kilometer
kPa	Kilopascal
kph	Kilometers Per Hour
kW	Kilowatts
lb (s)	Pound (s)
LK	Link
LMTV	Light Medium Tactical Vehicle
M	Meter
MAC	Maintenance Allocation Chart
max.	Maximum
MBT	Main Battle Tank
mm	Millimeter
mph	Miles Per Hour
m/s	Miles Per Second
MTOE	Modified Table of Organization and Equipment
NIIN	National Item Identification Number (consists of last 9 digits of NSN)
O.D.	Outside Diameter
OE	Lubricating Oil, Internal Combustion Engine
OVE	On Vehicle Equipment
oz	Ounce
PMCS	Preventive Maintenance Checks and Services
psi	Pounds Per Square Inch
PTO	Power Take Off
Q	Quarterly
Qty	Quantity

Table 2. Acronyms and Abbreviations List - Continued.

rpm	Revolutions Per Minute
RPSTL	Repair Parts and Special Tools List
S	Semiannually
s	Second
SATS	Standard Army Tool Set
SMAW	Shielded Metal Arc Welding
SMR	Source, Maintenance, and Recoverability
TAMMS	The Army Maintenance Management System
TMDE	Test, Measurement, and Diagnostic Equipment
U/M	Unit of Measure
VAC	Volts, AC (Alternating Current)
VDC	Volts of Continuous Current (Direct Current)
W	Weekly

END OF WORK PACKAGE

FIELD MAINTENANCE

EQUIPMENT DESCRIPTION AND DATA

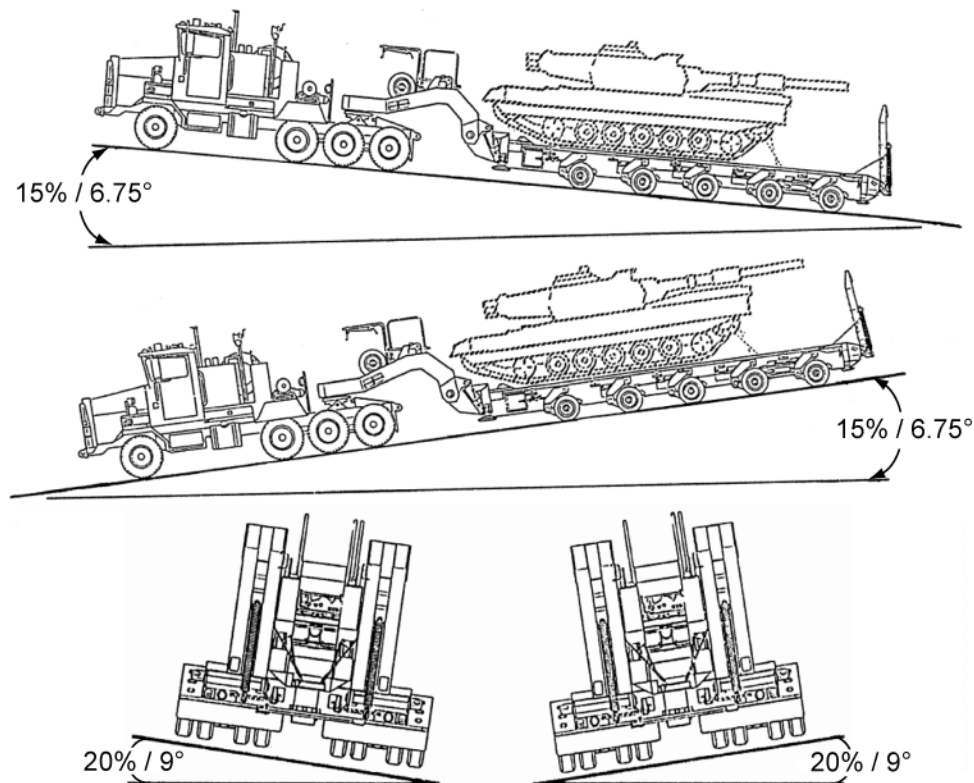
EQUIPMENT CHARACTERISTICS, CAPABILITIES, and FEATURES

The Heavy Equipment Transporter (HET) semitrailer is a flatbed trailer supported by five rows of axles. Each row consists of two axle units (bogies) with inner and outer dual tires mounted to each bogie.

The semitrailer's prime mover is the U.S. Army M1070 tractor. However, the adjustable gooseneck enables the semitrailer to also operate efficiently with the M911 HET semitrailer.

The tractor/semitrailer combination can operate going up or down a 15 percent grade and has a maximum towing speed of 45 mph (72.4 km/h) on primary roads, 40 mph (64.3 km/h) on secondary roads, and 15 mph (24.1 km/h) off road (Figure 1).

Fully loaded, the tractor/semitrailer combination can operate on a 20 percent side slope with either side facing upslope without tires coming off the ground or overextending the suspension assemblies (Figure 1).



HETT0002

Figure 1. Equipment Characteristics, Capabilities, and Features.

Fully loaded, the tractor/semitrailer can ford water to a maximum depth of 28 in. (71 cm), including wave height, without using additional water fording equipment (Figure 2).

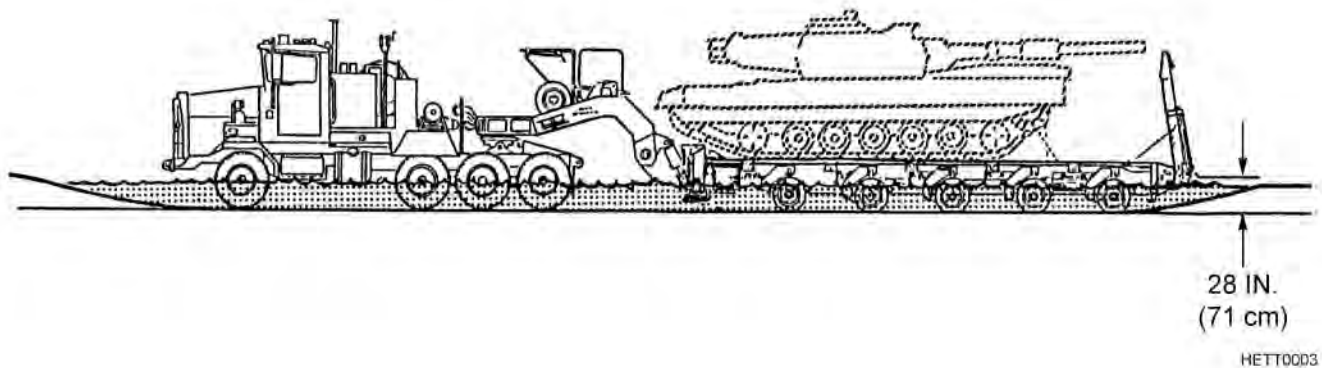


Figure 2. Equipment Characteristics, Capabilities, and Features.

Towing vehicles (tractors) provide electrical power and air brake (pneumatic) pressure to the semitrailer through standard inter-vehicular connections for brake lights, turn signals, blackout lights, clearance lights, and also service and emergency brakes.

The semitrailer is automatically steered in response to the turning of the tractor. When in tow, the semitrailer can negotiate a 90 degree turn in one continuous motion at an intersection from one 30 ft (9 m) wide road to another 30 ft (9 m) wide road (Figure 3).

The Auxiliary Power Unit (APU) provides power for the entire hydraulic system and is used for independent adjustments of the suspension, steering, and gooseneck.

The bogies (suspension system, axles, brakes, and wheels) simultaneously move up and down and can be individually isolated, allowing access for tire changes or trailer movement with a disabled bogie.

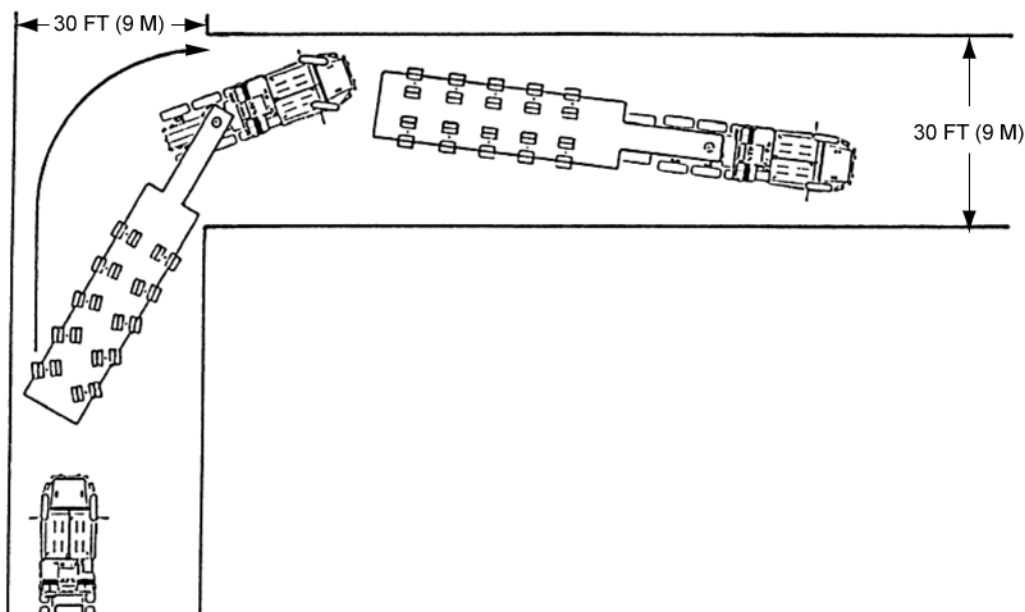
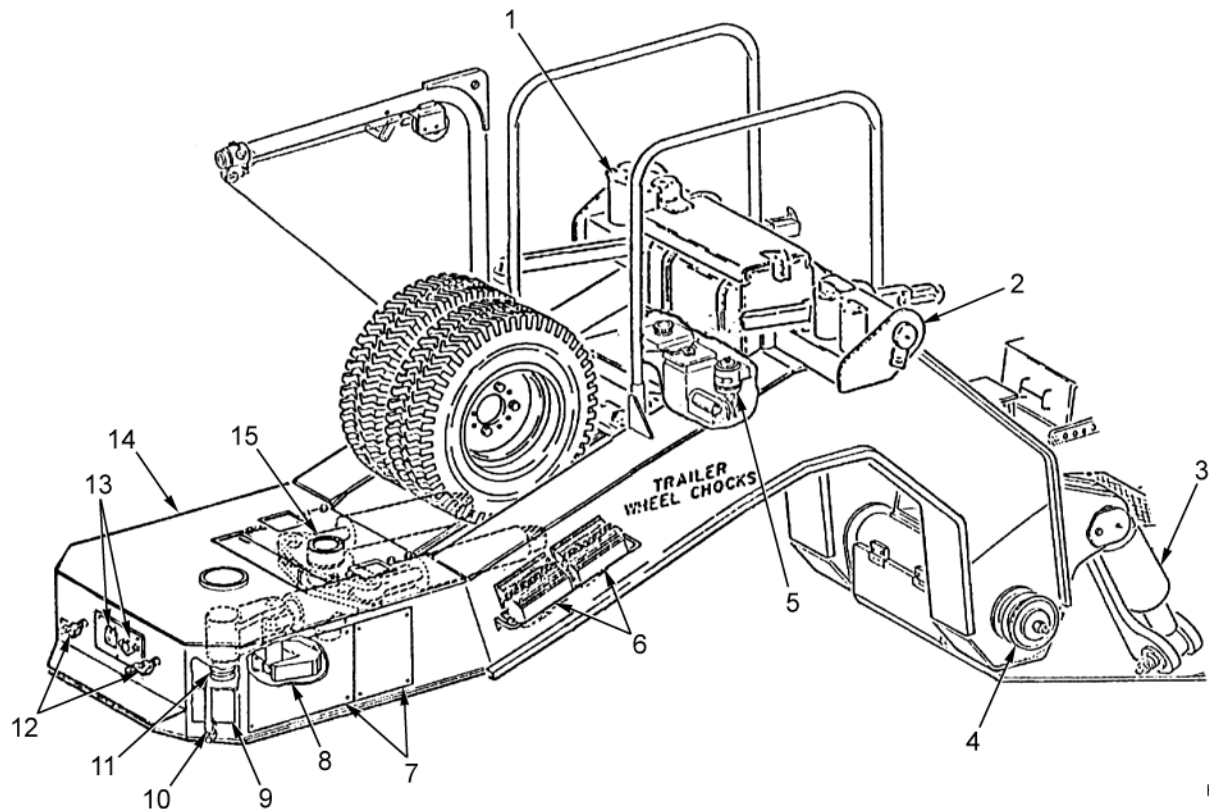


Figure 3. Equipment Characteristics, Capabilities, and Features.

LOCATION and DESCRIPTIONS of MAJOR COMPONENTS

Table 1. Major Components.

ITEM NUMBER	DESCRIPTION
1	CABLE GUIDES
2	CABLE GUIDES
3	GOOSENECK HYDRAULIC CYLINDERS
4	CABLE SHEAVE
5	AUXILIARY POWER UNIT (APU)
6	WHEEL CHOCKS
7	DATA and LUBE PLATES
8	STEERING WEDGE
9	STEERING CONSOLE
10	GRAB HANDLE
11	KING PIN, FIFTH WHEEL
12	INTERVEHICULAR CONNECTORS
13	INTERVEHICULAR CONNECTORS
14	GOOSENECK ASSEMBLY
15	STEERING GEAR ARM

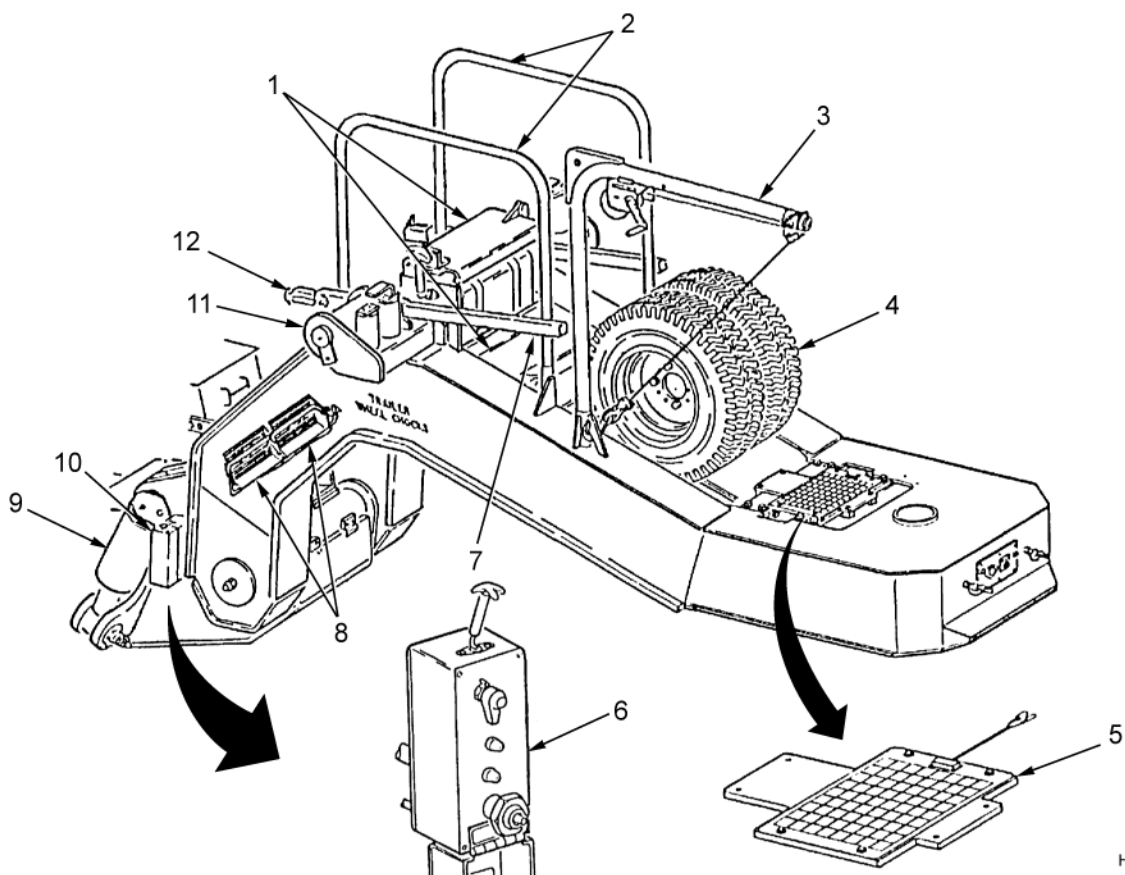


HETT0004

Figure 4. Major Components.

Table 2. Major Components.

ITEM NUMBER	DESCRIPTION
1	STEPS
2	GUARDRAIL
3	DAVIT
4	SPARE TIRES
5	SOLAR BATTERY CHARGER
6	APU CONTROL BOX
7	GOOSENECK SAFETY RAIL
8	WHEEL CHOCKS
9	GOOSENECK HYDRAULIC CYLINDER
10	APU CONTROL BOX
11	CABLE GUIDE
12	GOOSENECK SAFETY RAIL CLAMP

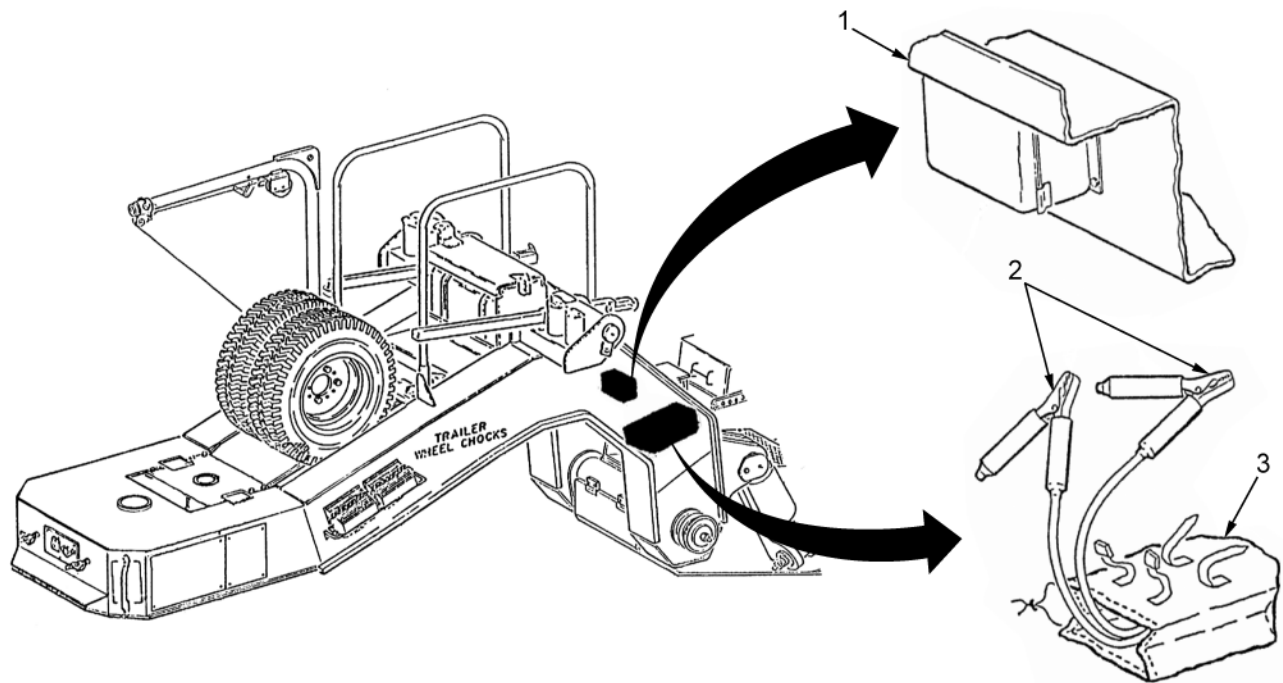


HETT0005

Figure 5. Major Components.

Table 3. Major Components.

ITEM NUMBER	DESCRIPTION
1	SAFETY CIRCUIT MODULE
2	APU AUXILIARY START CABLES
3	STOWAGE BAG

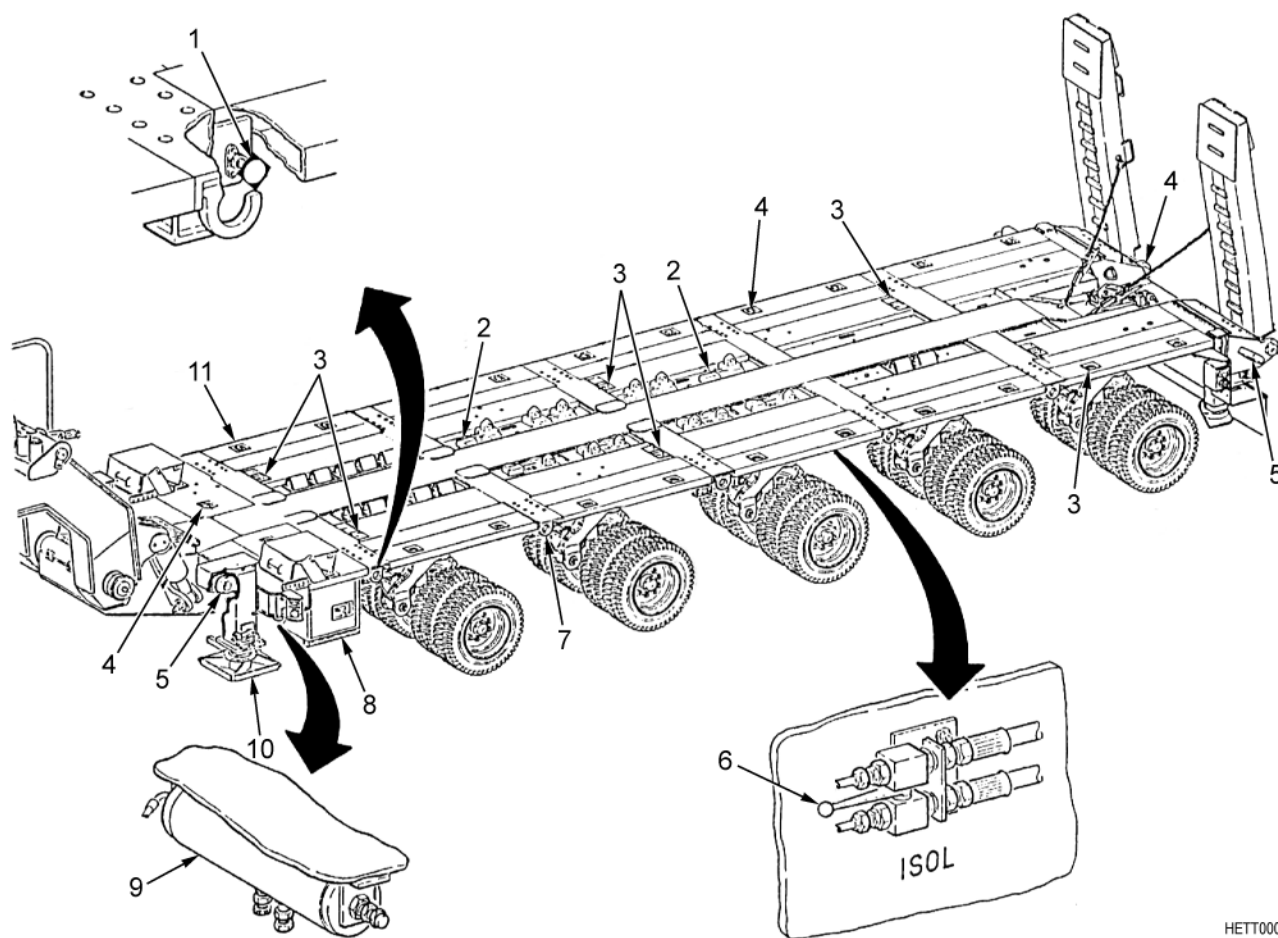


HETT0006

Figure 6. Major Components.

Table 4. Major Components.

ITEM NUMBER	DESCRIPTION
1	BRAKE RELEASE VALVE
2	ISO CONTAINER LOCK BRACKETS
3	PAYLOAD TIEDOWN RINGS
4	CARGO TIEDOWN RINGS
5	LIFTING EYES
6	SUSPENSION ISOLATION VALVES
7	TRANSPORT TIEDOWN RINGS
8	STOWAGE COMPARTMENT
9	AIR RESERVOIR
10	SUPPORT LEGS
11	PLATFORM ASSEMBLY



HETT0007

Figure 7. Major Components.

Table 5. Major Components.

ITEM NUMBER	DESCRIPTION
1	TRACK CURB GUIDES
2	PAYLOAD CHOCKS
3	HYDRAULIC GAUGE PANEL
4	HYDRAULIC CONTROL MODULE
5	PANEL COVER
6	BOGIE ASSEMBLY
7	HYDRAULIC SUSPENSION CYLINDERS
8	AXLE ASSEMBLY
9	SNATCH BLOCK
10	TIRE ASSEMBLY

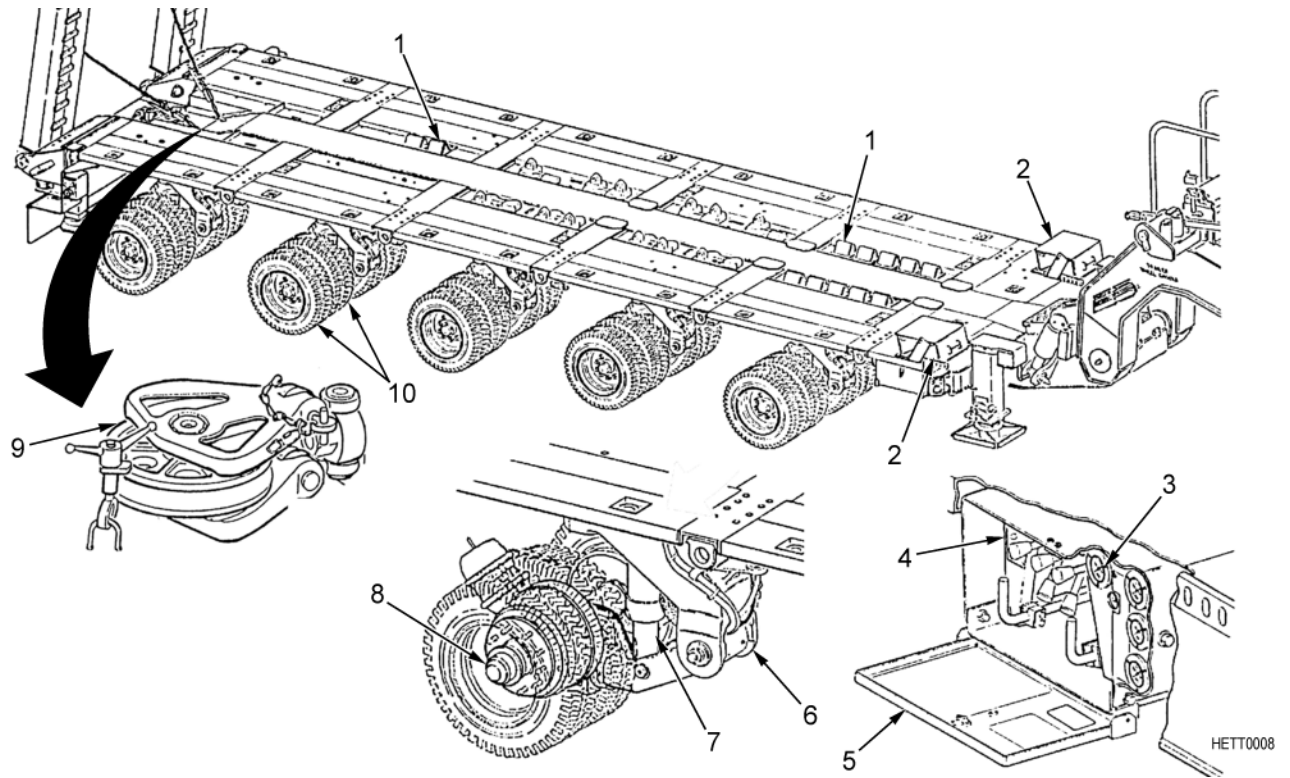
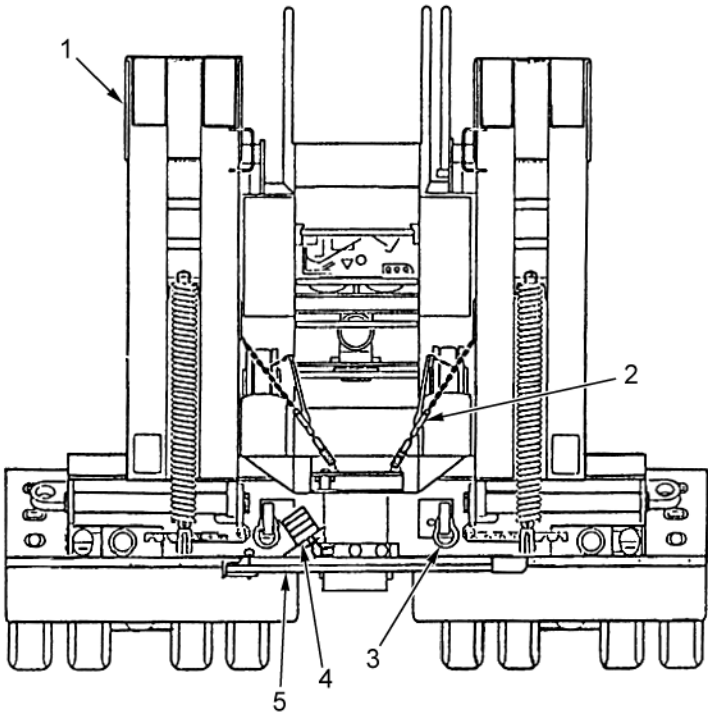


Figure 8. Major Components.

Table 6. Major Components.

ITEM NUMBER	DESCRIPTION
1	LOADING RAMP
2	SAFETY CHAIN
3	TOWING SHACKLE
4	BEACON WARNING LIGHT
5	CROWBAR and ISOLATION VALVE HANDLE EXTENSION



HETT0010

Figure 9. Major Components.

EQUIPMENT DATA

Table 7. Heavy Equipment Transporter (HET) Semitrailer Specifications.

MEASUREMENTS	U.S.	METRIC
Trailer:		
Length (Loading Ramps Up)	622 in.	1,580 cm
Length (Loading Ramps Down)	709.48 in.	1,802 cm
Width (Overall)	144 in.	366 cm
Ground Clearance (Normal)	15.5 in.	39 cm
Height:		
Normal (Loading Ramps Up)	124.8 in.	316.8 cm
Maximum (Loading Ramps Up)	134.8 in.	341.8 cm
Weight (Empty)	50,400 lb	22,882 kg
Weight (Fully Loaded)	190,400 lb	86,442 kg
Maximum Payload	140,000 lb	63,560 kg
Ground Pressure (Maximum Payload, Per Bogie Axle)	2,200 psi	151 kPa
Maximum Speed (Loaded):		
Highway	45 mph	72.4 km/h
Secondary	40 mph	64.3 km/h
Off-Road	15 mph	24.1 km/h
Maximum Grade	15%	
Maximum Side Slope	20%	
Center of Gravity (Empty) (From Kingpin)	342 in.	868 cm
Gooseneck:		
Overall Length	151 in.	384 cm
Length (Hinge Pin to Kingpin)	129 in.	328 cm
Width	48 in.	122 cm
Height, Normal (When Coupled to Tractor)	63 in.	160 cm
Kingpin to Ground (Platform at Normal Running Height):		
Maximum	92 in.	233 cm
Minimum	26 in.	66 cm
Steering Angle (No. 5 Bogie):		
Maximum Right	45°	
Maximum Left	45°	
Platform:		
Length	416.88 in.	1,058.9 cm
Width	120 in.	305 cm
Height:		
Normal	43 in.	134 cm
Maximum	53 in.	134 cm
Minimum	33 in.	84 cm
Loading Ramps:		
Width	24 in.	61 cm
Length	93.5 in.	237 cm
Loading Span Width:		
Maximum (Outer Edges)	136 in.	345 cm
Minimum (Inner Edges)	49 in.	125 cm

Table 7. Heavy Equipment Transporter (HET) Semitrailer Specifications - Continued.

MEASUREMENTS	U.S.	METRIC
APU: (Note: The APU is interchangeable when used with the appropriate control box [EB300-D used with SW31436; EB300-E used with SW31466-1]).		
Model	Kubota EB300D-S.A.E. or Kubota EB-300E	
Type	Water cooled, fuel injected, 4-cycle, diesel	
Cylinders	1	
Horsepower:		
Gross	8.4 hp/3,000 rpm	6.3 kW/3,000 rpm
Intermittent	7 hp/3,000 rpm	5.2 kW/3,000 rpm
Continued	6 hp/3,000 rpm	4.5 kW/3,000 rpm
Fuel Capacity	1.27 gal.	4.8 l
Oil Capacity	1.4 qt	1.3 l
Coolant Capacity	1.3 qt	1.2 l
Axles:		
Model	Rockwell International	
Type	TN with Post-121	
Quantity	10	
Rating	15,000 lb	6,810 kg
Brakes:		
Type	Cam-Master	
Shoe Size	12.25 x 7.5	
Lining	Type FF Semi-metallic	
Tires:		
Type	Micheline Tire Corp.	
Size	215/75 R17.5	
Pressure (Cold)	95 psi	655 kPa
Weight	57 lb	26 kg
Quantity	42	
Hydraulic System:		
System Pressure	3,900 psi	26,891 kPa
Fluid Capacity:		
Reservoir	16.5 gal.	64.5 l
System	27.0 gal.	105.5 l
Hydraulic Pump:		
Model	JS Barnes Corp.	
Type	Gear Pump	
Electrical System:		
	12/24 VDC	
Authorized Payloads:		
M1A1 Main Battle Tank	122,790 lb	55,697 kg
M60 Series Tank	113,900 lb	51,665 kg
M88 Tracked Medium Recovery Vehicle	112,000 lb	50,803 kg
M48A3 Tracked 90 mm Combat Tank	105,000 lb	47,628 kg
M621-B Scraper Tractor	65,000 lb	29,510 kg
M110E2 8 in. Howitzer	60,200 lb	27,307 kg

Table 7. Heavy Equipment Transporter (HET) Semitrailer Specifications - Continued.

MEASUREMENTS	U.S.	METRIC
M107 175 mm Self-Propelled Gun	59,200 lb	26,853 kg
M992 Tracked 7 ton 155 Ammo Carrier	58,500 lb	26,559 kg
M110 8 in. Howitzer	57,630 lb	26,141 kg
M578 Tracked Armor Recovery Vehicle	54,000 lb	24,516 kg
LVTP Tracked Personnel Landing Vehicle (7A1)	52,770 lb	23,958 kg
LVTR Tracked Recovery Landing Vehicle (7A1)	52,069 lb	23,639 kg
M3 Cavalry Fighting Vehicle	48,790 lb	22,131 kg
LVTC Tracked Command Landing Vehicle (7A1)	47,517 lb	21,572 kg
M2 Infantry Fighting Vehicle	47,000 lb	21,338 kg
M109A1 155 mm Howitzer	46,800 lb	21,280 kg
M109 155 mm Howitzer	44,437 lb	20,157 kg
M108 105 mm Howitzer	40,087 lb	18,183 kg
M9 ACV Armored Combat Earthmover	36,000 lb	16,344 kg
M981 FISTV Personnel Carrier	26,900 lb	12,213 kg
M113 Tracked Armored Personnel Carrier	24,986 lb	11,884 kg

END OF WORK PACKAGE

FIELD MAINTENANCE**THEORY OF OPERATION**

SYSTEM THEORY

The M1000 semitrailer is a fifth-wheel type, low-bed semitrailer that includes five hydraulically steered rows of bogie axles, 40 wheels and tires, and an operator-adjusted and leveled hydraulic suspension. A liquid-cooled, single-cylinder, diesel engine-powered Auxiliary Power Unit (APU) is provided to operate the trailer's hydraulic suspension, gooseneck, steering, and rear loading ramps. The M1000 is designed and configured to transport a combat-loaded Abrams Main Battle Tank (MBT) and current tracked and wheeled vehicles of similar dimensions with a gross weight not exceeding 70 tons. The semitrailer is intended to permit operation over OCONUS public highways and secondary roads with a minimum amount of special permits. In a tactical environment, the design is intended to permit limited operations on unimproved roads, trails, and cross-country terrain at the tactical support mobility levels (combat weights).

The M1070 HET tractor is the principal prime mover of the M1000 semitrailer. The M1070/M1000 system is designated the Heavy Equipment Transport System (HETS). The M1070 is an 8 by 8 configuration with a front-powered steering axle. The M1070 is powered by a 500 hp, two-cycle, diesel engine coupled to a five-speed transmission, transferring power through a two-speed transfer case. The HET tractor cab seats five personnel and has provisions for sleeping two personnel. The tractor is equipped with two hydraulic, drum-type winches, rated at 55,078 lb (245 kN) each, and uses a four preset tire pressure central tire insulation system (CTIS) to maintain tire air pressure. The chassis consists of an underslung parabolic taper-leaf front suspension and an on/off road, tri-drive, air ride, rear suspension.

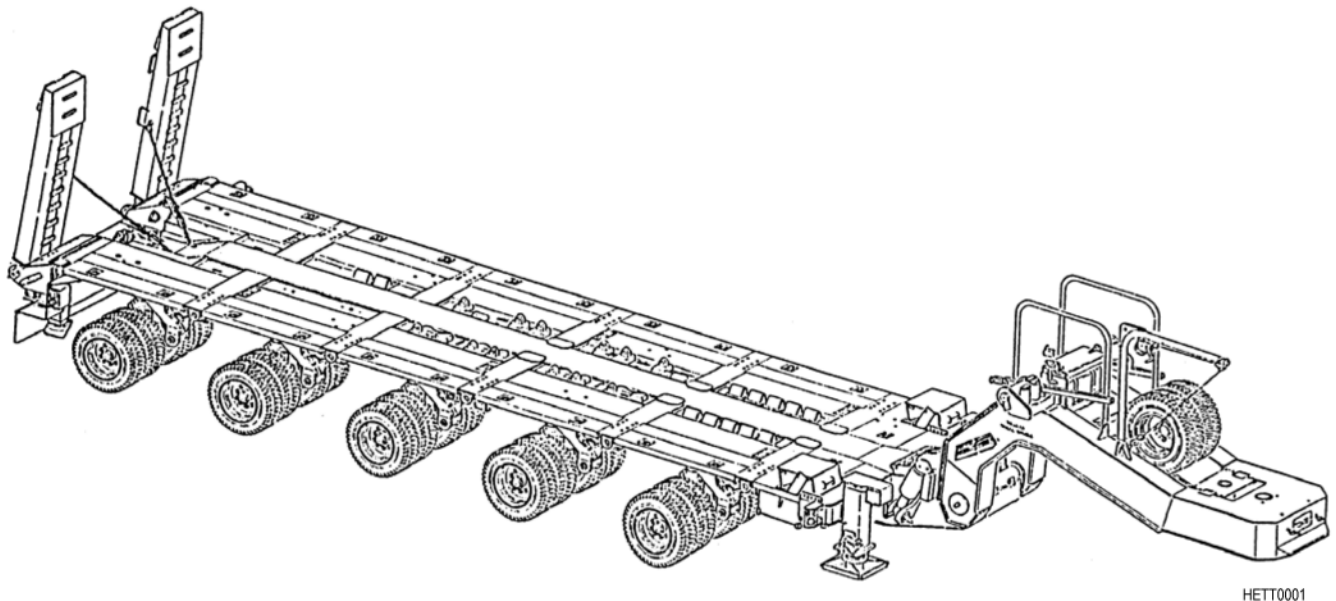


Figure 1. M1070 Heavy Equipment Transporter (HET) Semitrailer.

END OF WORK PACKAGE

CHAPTER 2
OPERATOR INSTRUCTIONS
FOR
SEMITRAILER, TRANSPORTER, HEAVY EQUIPMENT 70 TON, M1000

FIELD MAINTENANCE**DESCRIPTION AND USE OF OPERATOR CONTROLS AND INDICATORS**

GENERAL INFORMATION

This work package provides a general description of the Heavy Equipment Transporter (HET) semitrailer controls and indicators.

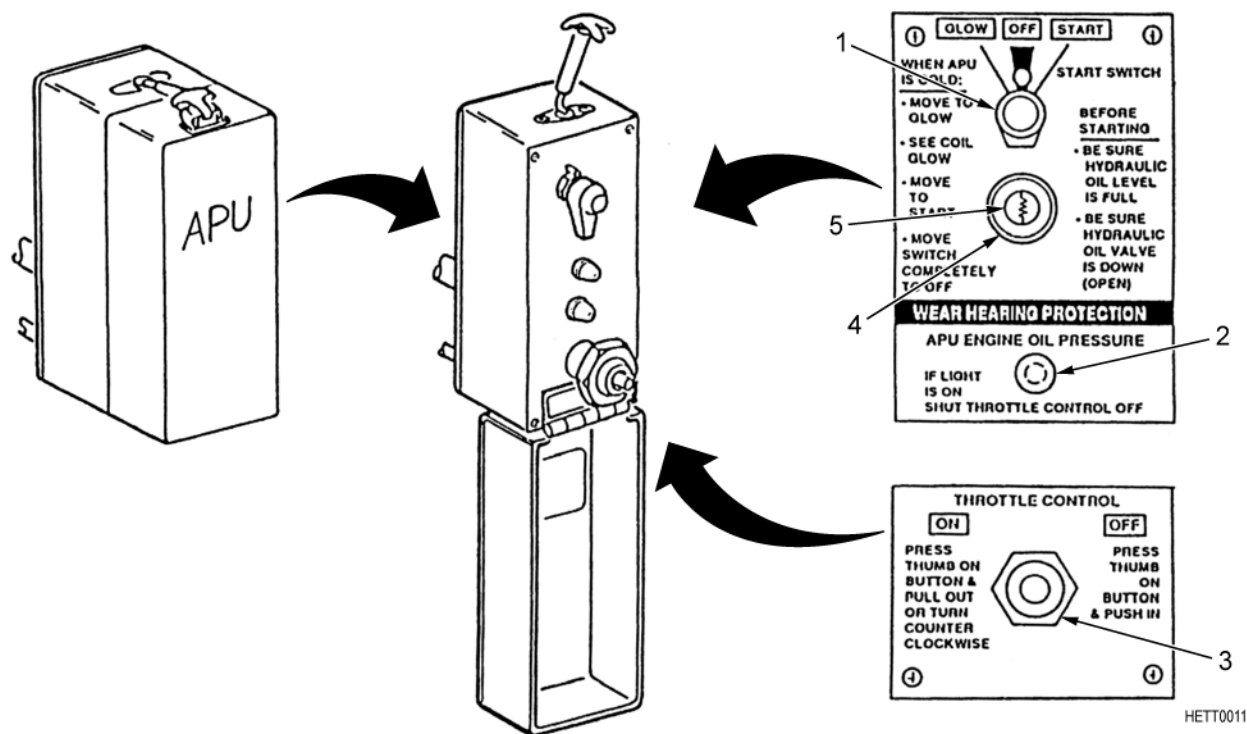


Figure 1. APU Control Box Controls.

AUXILIARY POWER UNIT (APU) CONTROL BOX

The APU START SWITCH (Figure 1, Item 1) is a three-position GLOW/OFF/START switch that is used to provide power to the APU for electric starting and battery charging. In the GLOW position (momentary), the APU glow plug warms and prepares the APU for starting. In the OFF position, the APU charging circuit is disabled. This switch will not shut off the APU. In the START position (momentary), the starter is engaged.

NOTE

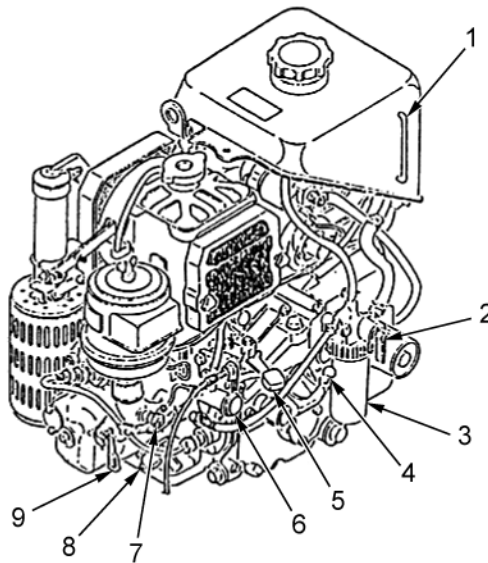
On the control box used with APU model EB300E, the glow plug indicator is changed from a glow-type indicator to a lamp driven by a timer.

The OIL PRESSURE INDICATOR (Figure 1, Item 2) illuminates when the oil in the APU has not reached normal operating pressure. Once the engine operating oil pressure has been reached, the light will go out. If the oil pressure indicator does not go out within 5 seconds, a malfunction in the engine is indicated.

The THROTTLE CONTROL (Figure 1, Item 3) is a push/pull cable controller that manually adjusts the speed of the APU. To increase the APU speed, press the center knob and pull outward on the throttle control. Fine adjustments may be made by turning the throttle control clockwise (to increase) or counterclockwise (to decrease). To decrease speed, push in the throttle control. To shut down the APU, push in the throttle control.

The GLOW PLUG INDICATOR (GLOW TYPE) (Figure 1, Item 4) illuminates when the APU START SWITCH is placed and held in the GLOW position. The indicator element glows red when the glow plug conductor has become warm enough to assist in starting the APU.

The GLOW PLUG INDICATOR (LAMP) (Figure 1, Item 5) illuminates when the APU START SWITCH is placed and held in the GLOW position and extinguishes 5 seconds later to indicate that the glow plug is warm enough to assist in starting the APU.



HETT0012

Figure 2. APU Controls.

APU CONTROLS AND INDICATORS

The FUEL TANK SIGHT INDICATOR (Figure 2, Item 1) is a sight tube that shows how much fuel is in the fuel tank.

The FUEL PETCOCK VALVE (Figure 2, Item 2) is a two-position valve that is used to allow fuel to flow to the engine when in the OPEN position and to shut off fuel when in the CLOSED position. When CLOSED, air is vented from the fuel line and filter.

The FUEL FILTER (Figure 2, Item 3) is used to filter fuel coming from the tank. The clear sediment bowl enables the operator to check the filter for trapped particles and contaminants.

The OIL LEVEL GAUGE (Figure 2, Item 4) uses a dipstick to measure the oil level in the APU crankcase. Two marks indicate when the oil level is full or when oil needs to be added. When checking oil level, the gooseneck must be positioned at normal travel height to achieve an accurate reading.

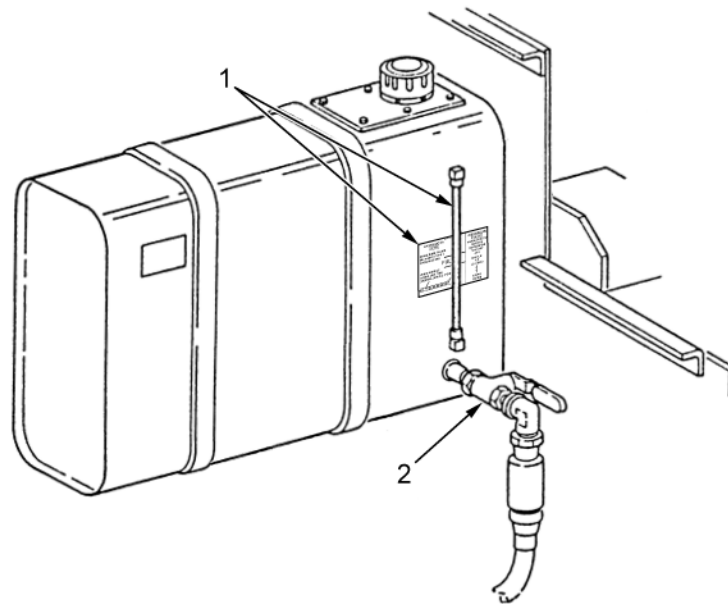
The APU control box THROTTLE CONTROL cable connects to the SPEED CONTROL LEVER (Figure 2, Item 5) and is used to throttle the speed of the APU. It is also used to shut down the APU by pushing the lever to the farthest right position.

The JET START PLUNGER (Figure 2, Item 6) is a piston-type pump. Pull out and push in the jet start plunger to inject fuel in the air intake of the APU as a cold weather starting aid.

The JET START COCK (Figure 2, Item 7) is a needle valve that controls the flow of fuel for the jet start plunger. When turned clockwise (closed), fuel is shut off to the jet start system. When turned counterclockwise (open), fuel flows from the jet start system.

The DRAIN VALVE (Figure 2, Item 8) is used to drain the coolant from the radiator and engine block. Turn counterclockwise to drain, and turn clockwise to close. Keep the drain valve closed during APU operation.

The DECOMPRESSION VALVE (Figure 2, Item 9) is used with the APU jump start for arctic weather starting of the APU. When held open (up), the decompression valve partially opens the exhaust valve of the APU, and compression is reduced during cranking. Normal position for this valve is spring-loaded closed (handle pointing down).



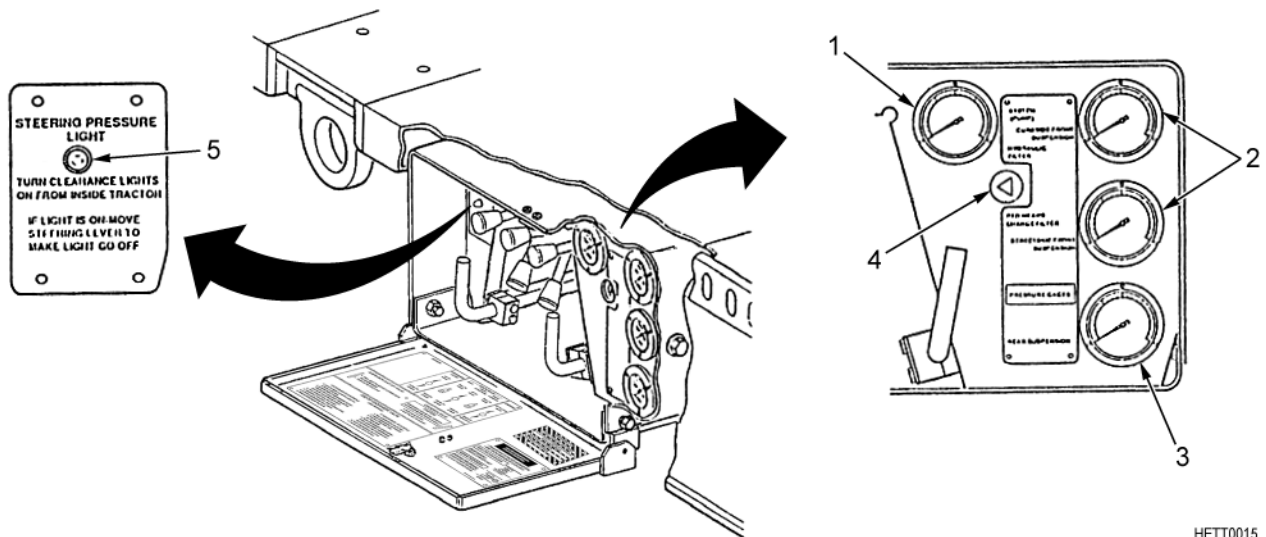
HETT0013

Figure 3. Hydraulic Tank Controls.

HYDRAULIC TANK CONTROLS AND INDICATORS

The HYDRAULIC OIL LEVEL (Figure 3, Item 1) has an indicator and decal that identify the amount of fluid that should be in the hydraulic tank when the semitrailer is level and at normal road height.

HYDRAULIC OIL VALVE (Figure 3, Item 2) is a ball valve that is used to cut off the supply of hydraulic fluid from the hydraulic tank to the hydraulic pump. The normal position for this valve is OPEN, with the valve handle in line with the valve body. To close the hydraulic oil valve, pull the valve handle upright. This valve must be in the OPEN position prior to running the APU.



HETT0015

Figure 4. Hydraulic Pressure Gauge Panel Controls.

HYDRAULIC PRESSURE GAUGE PANEL CONTROLS

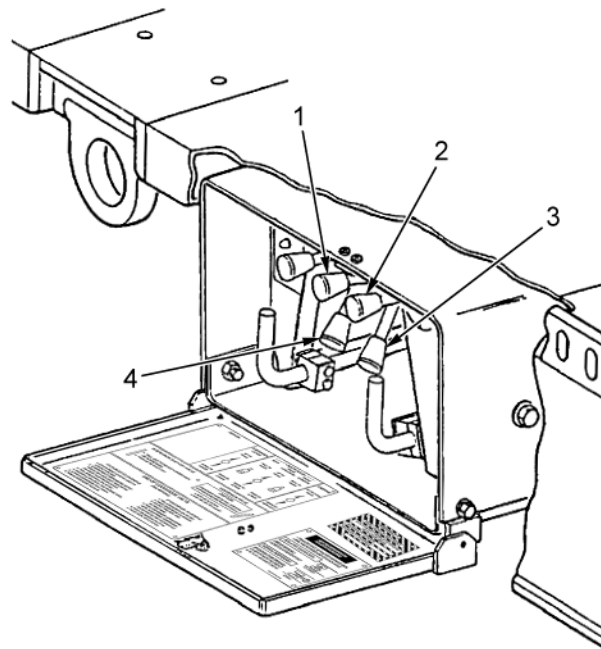
The **SYSTEM PRESSURE GAUGE** (Figure 4, Item 1) indicates from 0 to 6,000 psi (0 to 41,369 kPa) and measures hydraulic pressure for the overall system during APU operations. With the APU running and no valves activated, this gauge should read approximately 0 to 200 psi (0 to 1,379 kPa). When performing hydraulic adjustments, the system pressure may increase to a maximum reading of 4,100 psi (28,269 kPa), which is system relief pressure.

The **FRONT CURBSIDE and STREETSIDE SUSPENSION PRESSURE GAUGES** (Figure 4, Item 2) indicate from 0 to 6,000 psi (0 to 41,369 kPa) and measure hydraulic pressure for the front curbside and front streetside suspension circuits (three front bogies and gooseneck cylinder, each side, when gooseneck isolation valve is in the RUN position). When the semitrailer is unloaded and valves are not being operated, these gauges normally read 700 to 1,100 psi (4,826 to 7,584 kPa). When raising either curbside or streetside front suspension, the respective gauge will increase to a maximum of 4,100 psi (28,269 kPa) when the suspension tops out. When lowering either curbside or streetside front suspension, the pressure will decrease to 0 psi (0 kPa) when the suspension bottoms or the weight is supported by the front and rear support legs.

The **REAR SUSPENSION PRESSURE GAUGE** (Figure 4, Item 3) indicates from 0 to 6,000 psi (0 to 41,369 kPa) and measures hydraulic pressure for the rear suspension circuit (four rear bogies). When the semitrailer is unloaded and the rear suspension valve is not being operated, this gauge normally reads 700 to 1,100 psi (4,826 to 7,584 kPa). When raising rear suspension, the pressure will increase to a maximum of 4,100 psi (28,269 kPa) when the suspension tops out. When lowering rear suspension, the pressure will decrease to 0 psi (0 kPa) when suspension bottoms or weight is supported by support legs.

The **HYDRAULIC FILTER GAUGE** (Figure 4, Item 4) is a colored gauge that is used to identify blockage or contamination in the hydraulic filter element. The normal indication while the APU is running should be in the green zone. If the reading is in the yellow zone, the element is starting to become contaminated and should be replaced no later than the next scheduled maintenance. If the reading is in the red zone, the filter is contaminated and should be replaced. In cold weather conditions, the gauge will read out of the green zone until the oil has warmed to normal operating temperature.

The **STEERING PRESSURE INDICATOR** (Figure 4, Item 5) lights when the hydraulic pressure in the automatic steering system drops below 68 psi (469 kPa) and the running light circuit is powered. Once pre-charge pressure is restored to the steering system by running the APU and momentarily operating the steering control valve in both directions, the light will go out.



HETT0016

Figure 5. Hydraulic Controls and Isolation Valves.

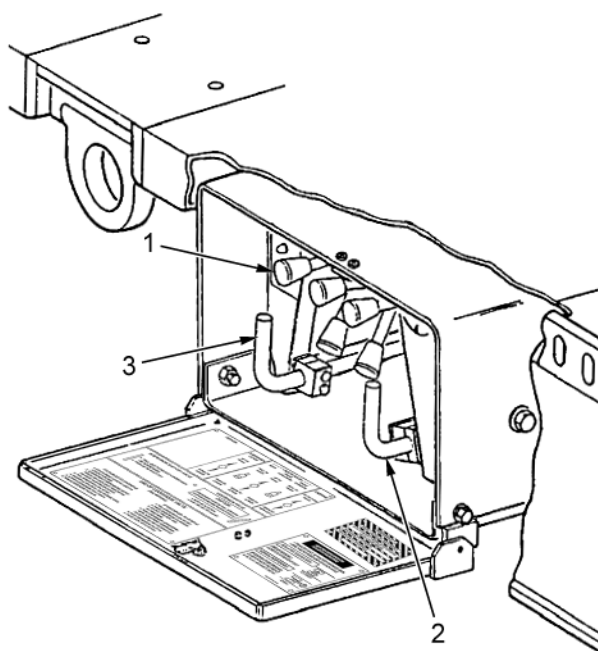
HYDRAULIC CONTROLS AND ISOLATION VALVES

The FRONT STREETSIDE VALVE (Figure 5, Item 1) is a three-position hydraulic valve that is spring-loaded to the center (neutral) position and used to provide hydraulic pressure for raising and lowering the three front streetside bogies. Pull up to raise front streetside of the platform, or push down to lower front streetside of the platform. This function will not operate if the suspension shutoff valve handle is pushed inward to the SHUTOFF position.

The STEERING VALVE (Figure 5, Item 2) is a three-position hydraulic valve that is spring-loaded to the center (neutral) position and used to provide manual steering to the steerable bogies when coupled to a winch vehicle. When the lever is pulled up, bogies are realigned for a right-hand turn; when the lever is pushed down, bogies are realigned for a left-hand turn.

The FRONT CURBSIDE VALVE (Figure 5, Item 3) is a three-position hydraulic valve that is spring-loaded to the center (neutral) position and used to provide hydraulic pressure for raising and lowering the three front curbside bogies. Pull up to raise the front curbside of the platform, or push down to lower the front curbside of the platform. This function will not operate if the suspension shutoff valve handle is pushed inward to the SHUTOFF position.

The REAR VALVE (Figure 5, Item 4) is a three-position hydraulic valve spring-loaded to the center (neutral) position and used to provide hydraulic pressure for either raising or lowering two rear left and right bogies. Pull up to raise the rear bogies, or push down to lower the rear bogies. This function will not operate if the suspension shutoff valve handle is pushed inward to the SHUTOFF position.



HETT0017

Figure 6. Hydraulic Controls and Isolation Valves.

HYDRAULIC CONTROLS AND ISOLATION VALVES

The GOOSENECK VALVE (Figure 6, Item 1) is a three-position hydraulic valve that is spring-loaded to the center (neutral) position and used to provide hydraulic pressure for either raising or lowering the gooseneck. The semitrailer must be uncoupled, and the gooseneck isolation valve must be in the ADJUST (pulled outboard) position to make adjustments. Pull up to raise the gooseneck, or push down to lower the gooseneck. This function will not operate correctly if the suspension shutoff valve handle is pushed inward to the SHUTOFF position.

The SUSPENSION SHUTOFF VALVE (Figure 6, Item 2) is a series of ball valves that are used to shut off hydraulic power to the semitrailer suspension. There are two positions for this valve handle: pushed inward is SHUTOFF, and pulled outward is ADJUST. When in the SHUTOFF position, the ball valves are closed and provide protection against unexpected suspension and/or gooseneck movement. When in the ADJUST position, the ball valves are open and allow normal suspension and gooseneck adjustments to be made. The valve handle should be placed in the ADJUST position as soon as the APU is started and prior to making any adjustments to the platform/gooseneck. This valve must be placed in the SHUTOFF position for driving or parking storage. If the semitrailer is to be parked/stored while uncoupled from a tractor, the gooseneck must be completely lowered before moving this valve handle from the ADJUST to SHUTOFF position.

The GOOSENECK ISOLATION VALVE (Figure 6, Item 3) is a series of ball valves that are used to isolate the gooseneck hydraulic cylinders from the suspension equalization system. When the gooseneck needs adjusting, or the semitrailer is being uncoupled from a tractor, the gooseneck isolation valve handle must be pulled outward (ADJUST) to prevent the gooseneck from falling and damaging any equipment. When coupled to a tractor, the normal position for this valve handle is the RUN (inward) position. When uncoupled from a tractor, the normal position for this valve is in the ADJUST (outward) position. This valve must be operated only when coupling/uncoupling the semitrailer from a tractor or when gooseneck adjustments are required while uncoupled from a tractor. This valve handle must be placed in the RUN position for driving. If the semitrailer is to be parked/stored uncoupled from a tractor, the gooseneck must be completely lowered before moving this valve handle from the ADJUST to RUN position.

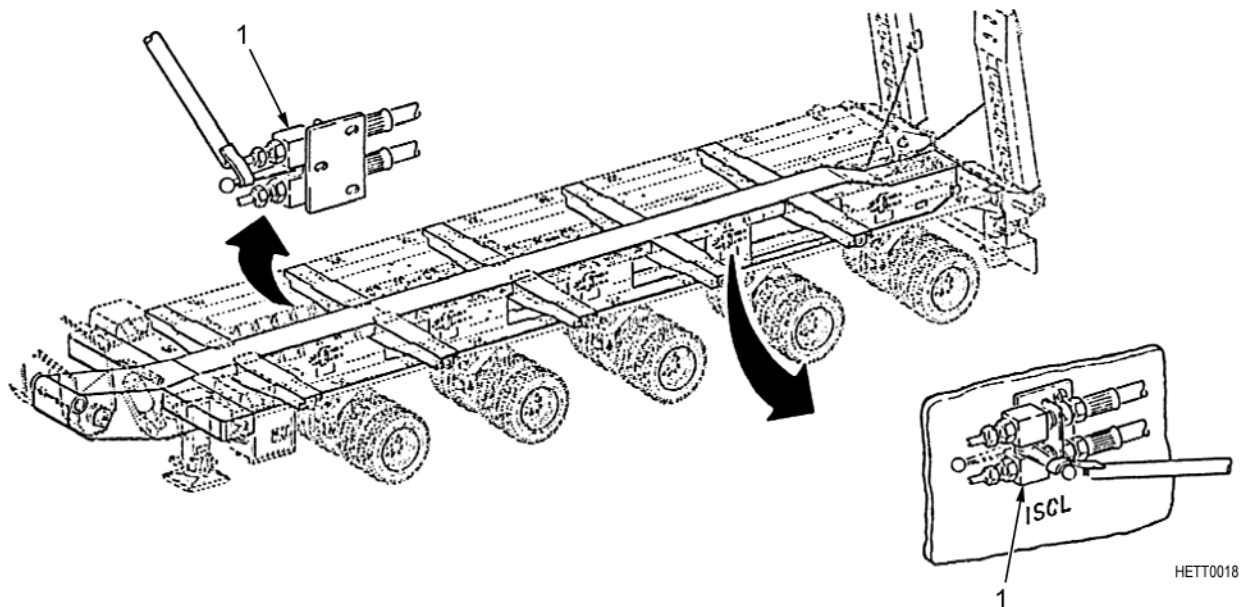


Figure 7. Hydraulic Controls and Isolation Valves.

HYDRAULIC CONTROLS AND ISOLATION VALVES

There are ten SUSPENSION ISOLATION VALVE (Figure 7, Item 1) assemblies on the semitrailer, one for each bogie unit. The suspension isolation valve is used to isolate a suspension cylinder of an affected bogie from the hydraulic system. The normal position for this valve is OPEN with the valve handle facing forward toward the front of the semitrailer. The isolation valve handle extension bar, located at the rear of the semitrailer below the loading ramps, should be used to open or close each suspension isolation valve. To isolate a bogie, find the appropriate isolation valve, insert the hook end of the isolation valve handle extension onto the isolation valve handle, and pull the valve handle outward to the CLOSED position. To un-isolate a bogie, place the hook end of the extension handle behind the CLOSED valve handle and push the valve handle forward, toward the front of the semitrailer, to the OPEN position.

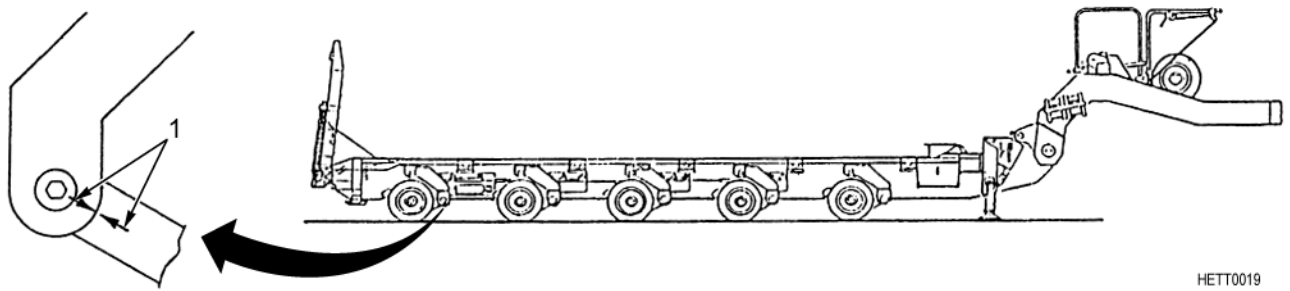


Figure 8. Bed Height Indicator.

BED HEIGHT INDICATOR CONTROLS

There are three BED HEIGHT INDICATORS (Figure 8, Item 1), one located on each No. 1 front curbside and streetside bogie and one on No. 5 rear curbside bogie. The bed height indicators point to each other when the platform height is set at road height, approximately 43 in. (109 cm) for that hydraulic subsystem.

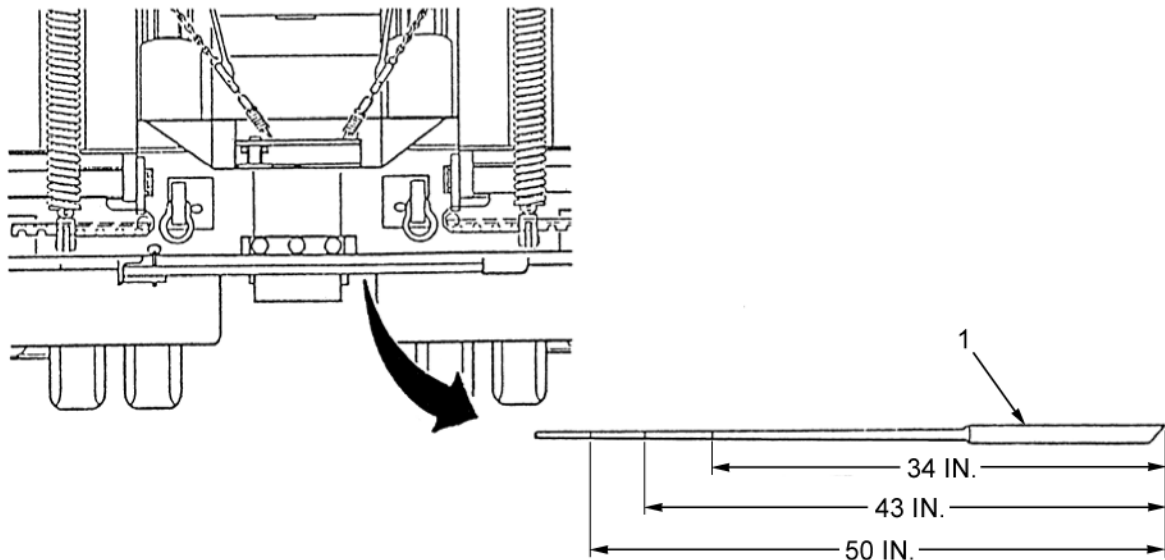


Figure 9. Crowbar.

CROWBAR

The CROWBAR (Figure 9, Item 1) has three permanently marked lines (WP 0036) to measure platform heights from the ground to the top of the platform. The bottom mark is for the rear platform loading position, 34 in. (86 cm). The center mark is for the normal platform height, 43 in. (109 cm). The top mark is for the front platform loading position, 50 in. (127 cm). When not in use, the crowbar is stowed on the rear of the semitrailer below the loading ramps.

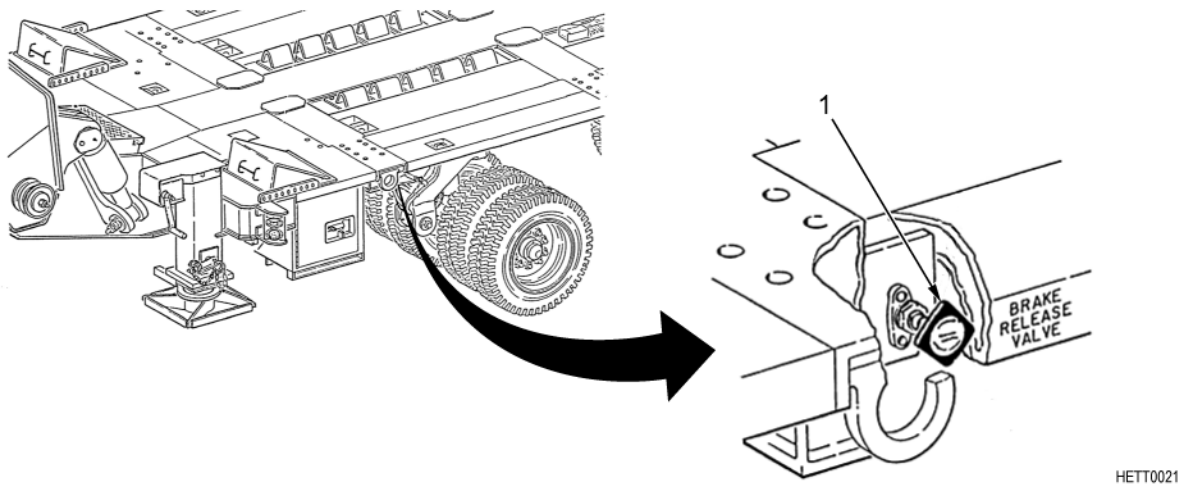


Figure 10. Brake Release Valve.

PNEUMATIC CONTROLS

The BRAKE RELEASE VALVE (Figure 10, Item 1) is a push/pull type valve used to disengage the parking brakes when the semitrailer is not connected to a tractor. Push in the handle to charge air pressure and release the parking brakes. Pull out the handle to release air pressure and to engage the parking brakes. This valve can only be cycled a few times before the air supply in the air tanks must be replenished.

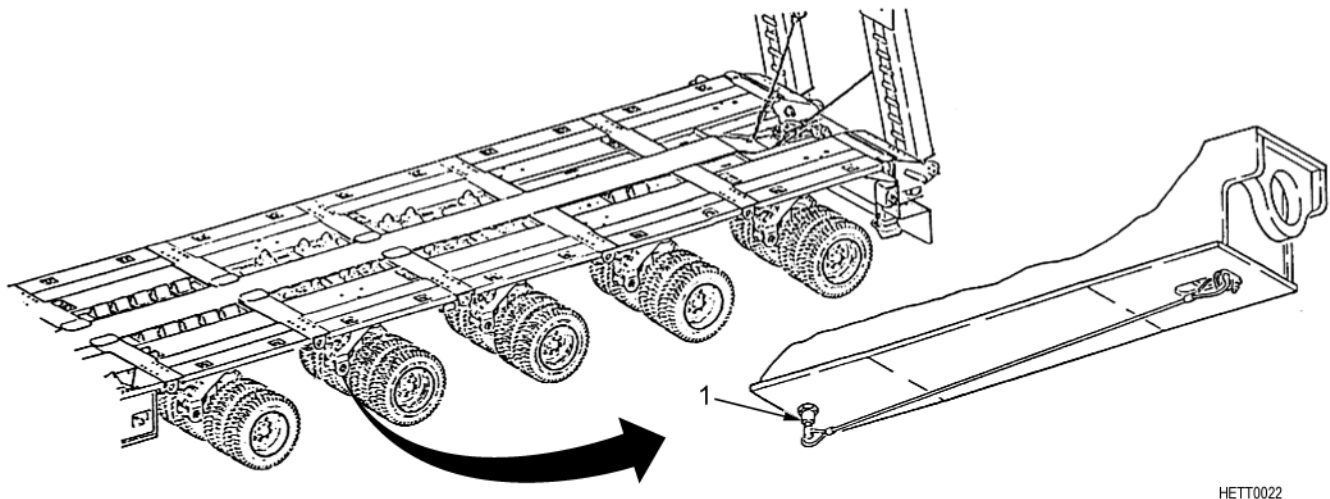
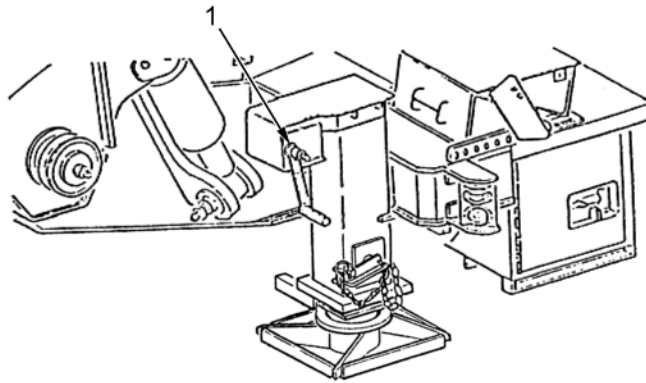


Figure 11. Air Tank Drain Valve.

There are five AIR TANK DRAIN VALVES (Figure 11, Item 1) on this semitrailer. Three are located on the curbside of the platform, and two are located on the streetside of the platform. These drain valves are used to drain either moisture or air pressure from air tanks. Pull and hold the lanyard until moisture is no longer being discharged or until all air in that tank is released.

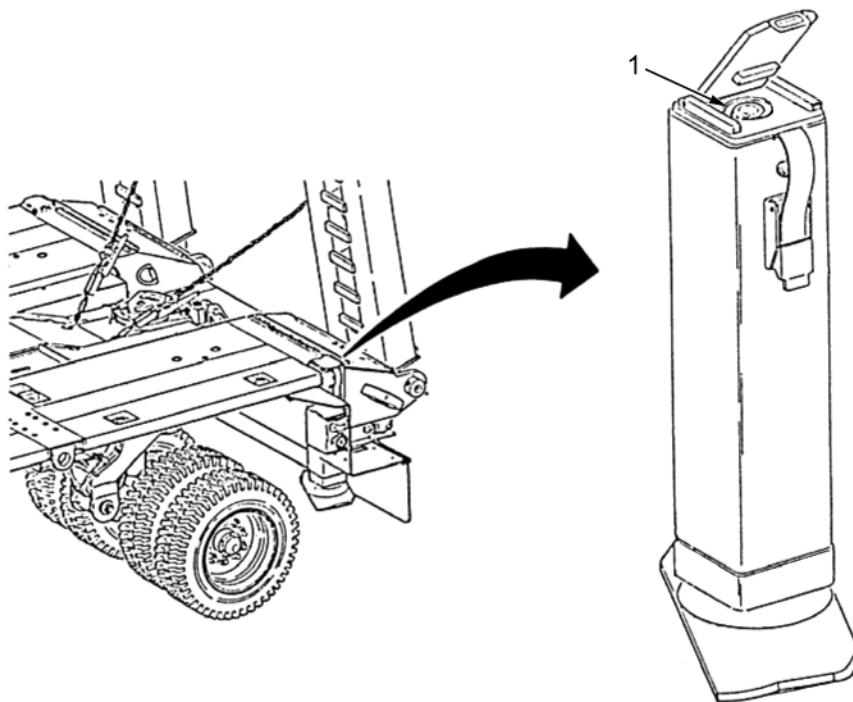


HETT0023

Figure 12. Front Support Leg Handcrank Controls.

HANDCRANK CONTROLS

The FRONT SUPPORT LEG HANDCRANK (Figure 12, Item 1) is a single-speed handcrank that operates an internal winch attached to a lifting strap. The handcrank is used to manually raise and lower the lower shaft and foot of the support legs. A retaining pin is used to lock the lower shaft in one of four preselected height settings (holes). The bottom hole of the lower shaft is used to stow the lower leg and foot during transport. The retaining pin is installed from the outboard side of each support leg. The handcrank for the curbside support leg is located on the inward side of the leg, while the handcrank for the streetside support leg is located on the outboard side of the leg. The streetside support leg also contains a step that provides personnel access to the platform. To lower and secure either support leg, rotate the handcrank counterclockwise until the desired retaining pin hole in the lower leg is aligned with the hole in the upper housing of the support leg. Install the retaining pin. To raise either leg, rotate the handcrank clockwise sufficiently to relieve tension on the retaining pin. Remove the pin and continue cranking in a clockwise direction until desired selected height is reached. Insert the retaining pins.



HETT0024

Figure 13. Rear Support Leg Handcrank Controls.

The REAR SUPPORT LEG HANDCRANKS (Figure 13, Item 1) each contain an adjusting nut and require a ratchet and socket to lower or raise the support leg's lower tube and foot. To lower the support legs, raise the cover and use the ratchet and socket to rotate the adjusting nut counterclockwise to the desired position. Clockwise rotation of the adjusting nut raises the leg. To access the adjusting nut, release the cover latch and raise the metal cover sufficiently to engage the adjusting nut with the ratchet and socket. Upon completion of the rear support leg adjustment, put the cover back in position and secure it with the cover latch. To prevent in-transit vibration from rotating the adjusting nut and lowering the rear support leg, install a socket head screw on the adjusting nut that contacts a bar on the cover, preventing movement. Any time the cover is to be closed, ensure the socket head screw is positioned outboard prior to closing.

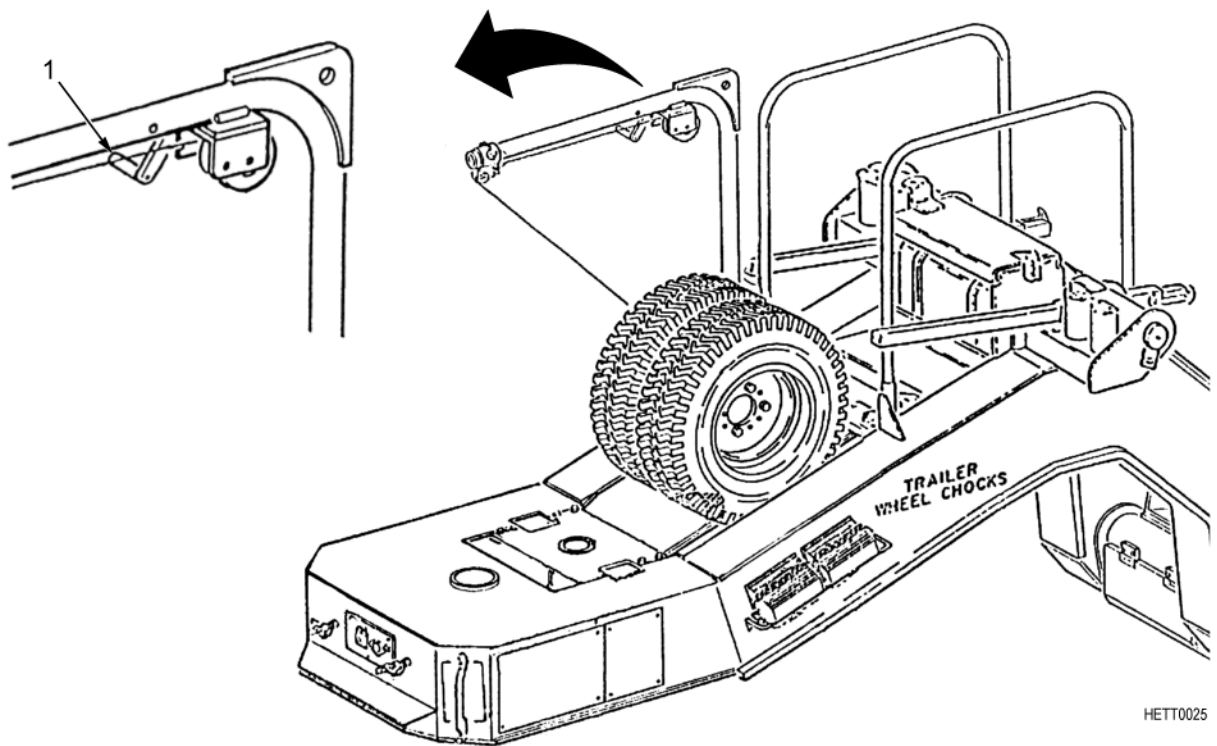


Figure 14. Winch Handcrank Controls.

WINCH HANDCRANK CONTROLS

The WINCH HANDCRANK (Figure 14, Item 1) is used to extend and retract cable from the winch spool on the davit assembly. The winch handcrank has an anti-slip device to prevent unintentional pay out of cable. To pay out cable, turn the winch handcrank counterclockwise while pulling on the winch cable. Turn the crank clockwise to retract the winch cable.

END OF WORK PACKAGE

FIELD MAINTENANCE**OPERATION UNDER USUAL CONDITIONS - AUXILIARY POWER UNIT (APU) STARTUP AND SHUTDOWN**

INITIAL SETUP:**References**

WP 0035

Personnel Required:

1

GENERAL INFORMATION

This work package contains instructions for the Heavy Equipment Transporter (HET) semitrailer Auxiliary Power Unit (APU) startup and shutdown.

Before operating the semitrailer, perform the Before (B) Preventive Maintenance Checks and Services (PMCS) (WP 0035) and perform all of the required preventive maintenance.

- Know the capabilities of the semitrailer and DO NOT exceed them.
- Know the capabilities and limitations of the tractor, when coupled, and DO NOT exceed them.
- Know how to use the gauges, indicators, and control features of the semitrailer in the safest manner.

APU STARTUP

NOTE

Ensure that the semitrailer is parked on level ground. If the tractor and semitrailer are coupled, apply the semitrailer's parking brakes.

1. Remove four wheel chocks (Figure 1, Item 3) from gooseneck (Figure 1, Item 1).
2. Place wheel chocks (Figure 1, Item 3) in front and behind each outer dual tire (Figure 1, Item 2) on both curbside and streetside No. 1 bogies (Figure 1, Item 4).

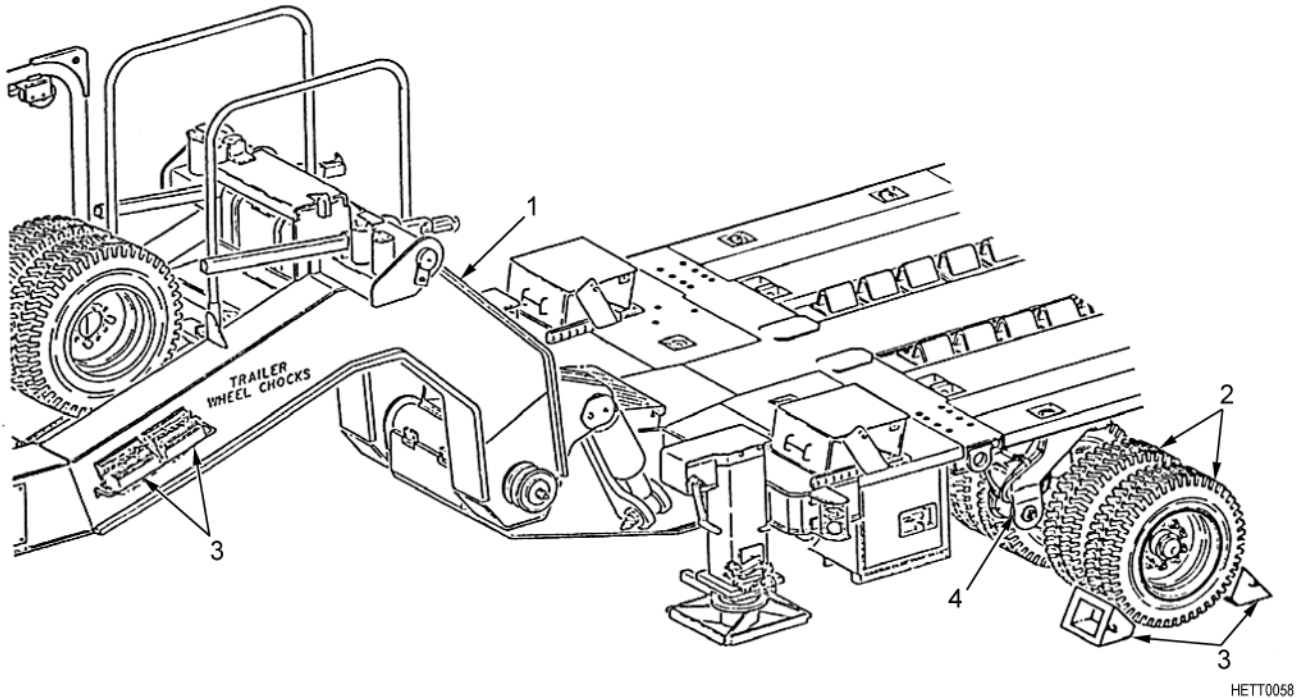


Figure 1. APU Startup.

WARNING

On some semitrailers, a solar battery charger is mounted on top of the gooseneck directly in front of the spare tires. Persons working on top of the gooseneck must take **EXTREME** care not to step on or trip over it. Failure to follow this warning may result in injury to personnel or damage to equipment.

3. At rear of gooseneck (Figure 2, Item 4), gain access to APU (Figure 2, Item 6) by unhooking step retainer (Figure 2, Item 1) and raising step section (Figure 2, Item 2) up and forward. Secure step section by hooking top step retainer to strap (Figure 2, Item 3) on step section.

CAUTION

The hydraulic tank oil valve must be open prior to starting the APU. Failure to follow this caution may result in serious damage to the hydraulic pump.

NOTE

Hydraulic tank oil valve is shown in the OPEN position.

4. Open hydraulic tank oil valve (Figure 2, Item 7).

NOTE

The fuel petcock is shown in the OPEN position.

5. Check that fuel petcock (Figure 2, Item 5) is in OPEN position.
6. Unhook strap (Figure 2, Item 3) from step (Figure 2, Item 2) and lower step to normal position. Secure step in place by hooking step retainer (Figure 2, Item 1) to catch on fixed bottom step section.

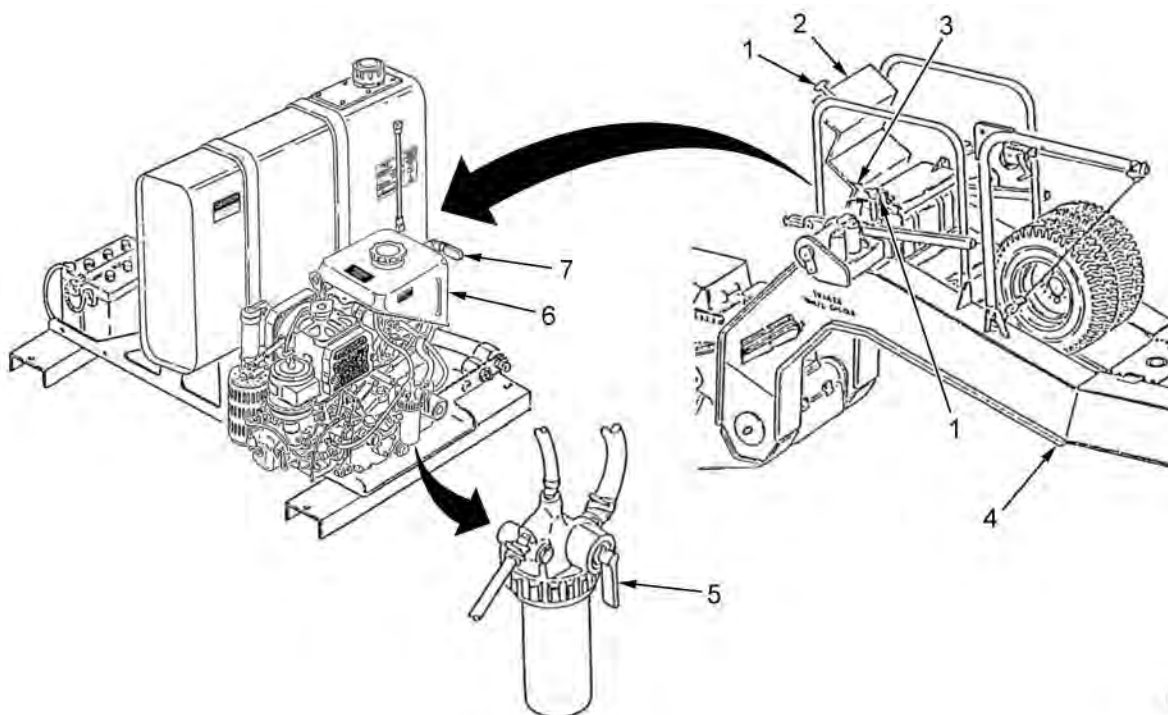


Figure 2. APU Startup.

WARNING

Hearing protection is required within 10 ft (3 m) of the APU when the APU is running. Failure to follow this warning may result in injury to personnel.

7. Open cover (Figure 3, Item 2) to APU control box (Figure 3, Item 3). Pull out throttle control (Figure 3, Item 1) fully.

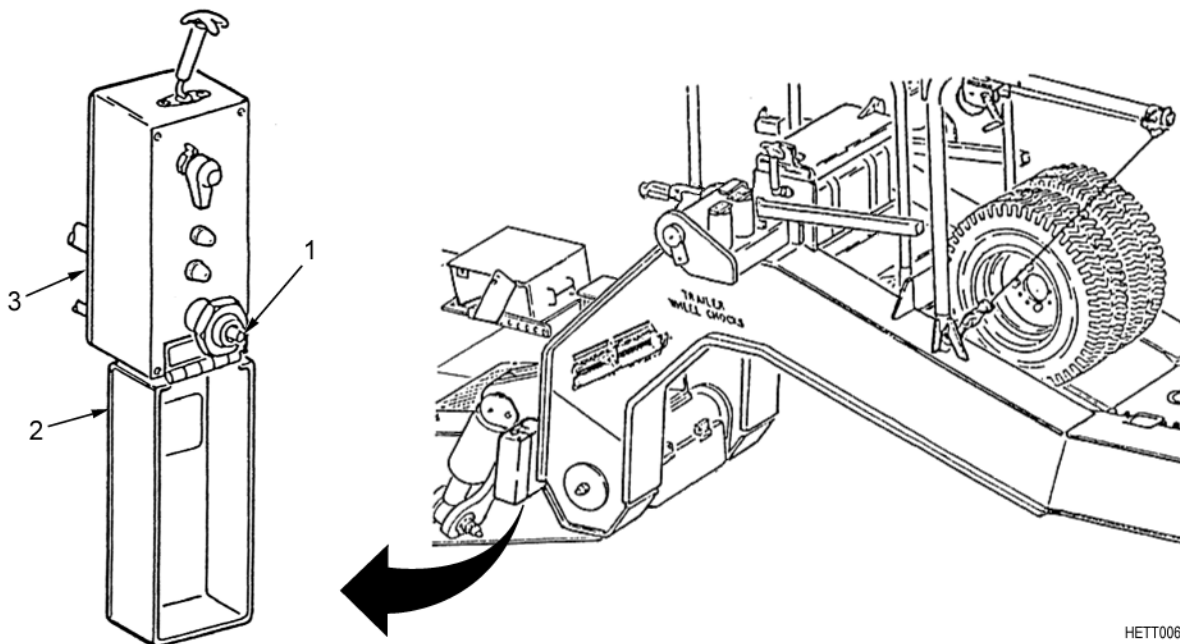


Figure 3. APU Startup.

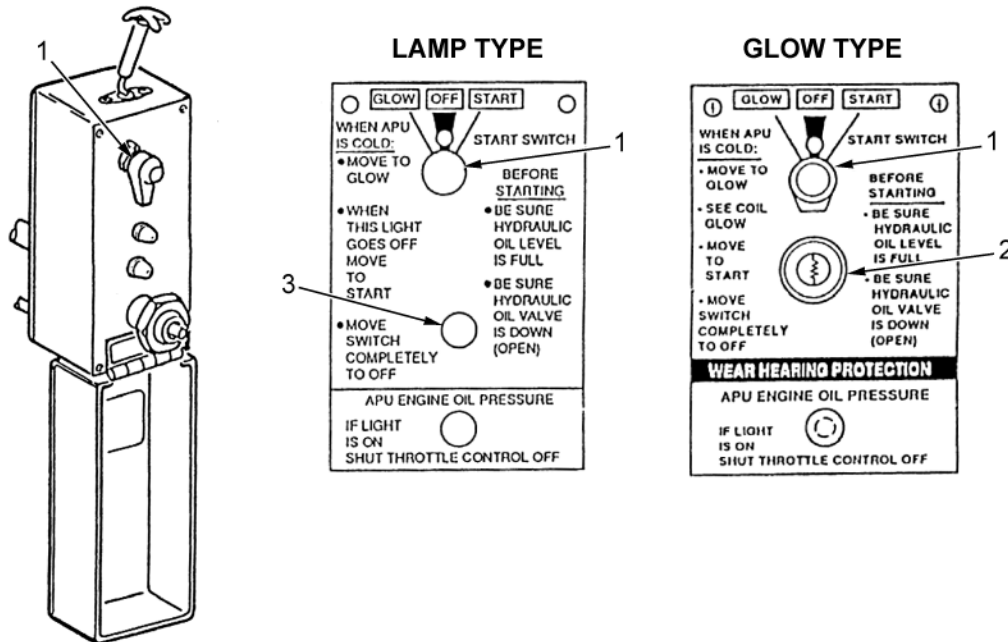
CAUTION

Oil pressure light must go out within 15 seconds. If oil pressure light stays lit, shut down APU immediately or damage to equipment may result.

NOTE

On the control box used with APU model EB300-E, the glow plug indicator is changed from a glow-type indicator to a lamp-type indicator, which is driven by a timer.

8. Turn START switch (Figure 4, Item 1) counterclockwise to GLOW position and hold.
 - a. In about 15 to 20 seconds, depending upon outside ambient temperature, the glow plug indicator (Figure 4, Item 2) for the GLOW TYPE indicator will glow brightly.
9. In about 15 to 20 seconds, depending upon outside ambient temperature, the glow plug indicator (Figure 4, Item 2) for the GLOW TYPE indicator will glow brightly.
10. The glow plug indicator (Figure 4, Item 3) for the LAMP TYPE indicator will light immediately. In 5 seconds the light will extinguish, indicating that the glow plug is warm enough to assist in starting.



HETT0822

Figure 4. APU Startup.

CAUTION

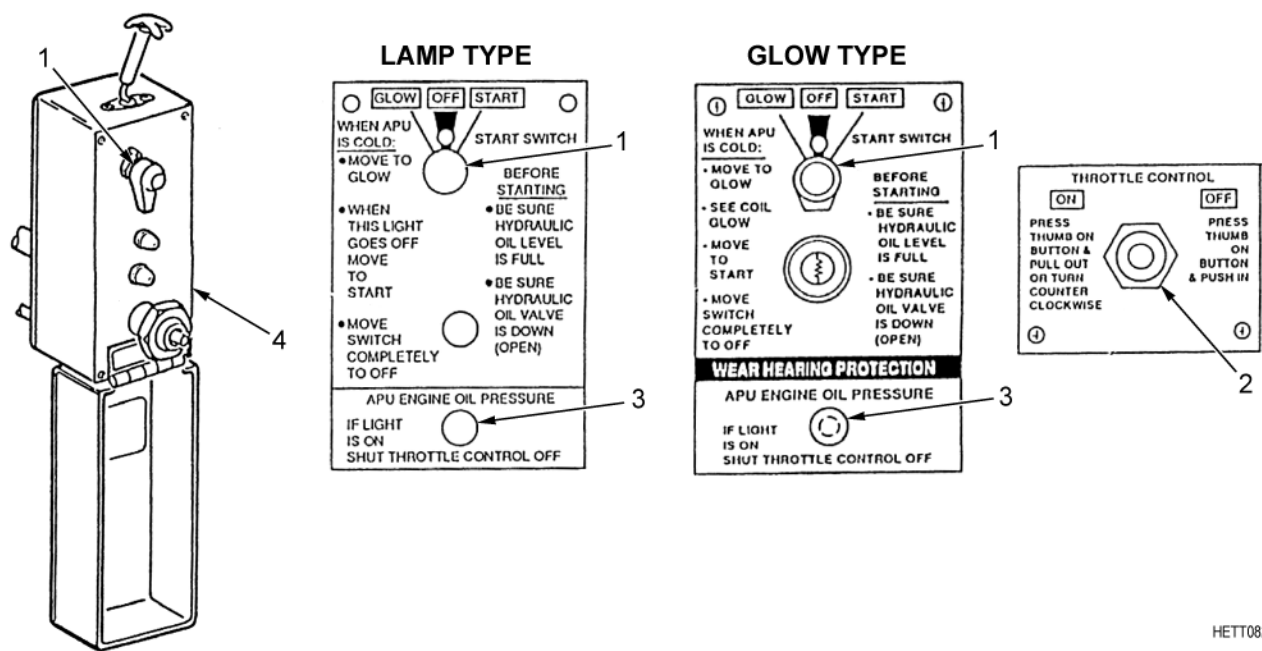
- **Release the switch from the START position to prevent overheating of the starter motor if the APU fails to start within 15 seconds. Allow the starter motor to cool 1 to 2 minutes before trying again. If the APU fails to start after four tries, notify field maintenance.**
- **DO NOT rotate the START switch to the START position while the starter motor is still turning from the previous try. This could result in serious damage to the starter motor and engine flywheel ring gear.**
- **Rotate START switch to OFF position after APU has started, or damage to equipment may result.**

11. Turn START switch (Figure 5, Item 1) clockwise to START position and hold for 15 seconds or until APU (Figure 5, Item 4) starts.
12. Once APU (Figure 5, Item 4) starts, immediately rotate START switch (Figure 5, Item 1) to OFF position.
13. If APU (Figure 5, Item 4) fires, but does not start, rotate START switch (Figure 5, Item 1) to OFF position. Wait for engine to stop turning and try again.
14. If APU (Figure 5, Item 4) fails to start after four attempts, rotate START switch (Figure 5, Item 1) to OFF position and notify field maintenance.
15. Check oil pressure indicator light (Figure 5, Item 3) once APU (Figure 5, Item 4) starts. If oil pressure indicator light does not go out once APU starts and has run for 15 seconds, shut down APU by pushing in throttle control (Figure 5, Item 2). Notify field maintenance. If oil pressure indicator light does go out, proceed with step 16.

CAUTION

DO NOT subject the APU to any load until it has warmed up properly. Premature failure may occur and the life of the engine may be shortened.

16. Allow APU (Figure 5, Item 4) to run at least 3 to 5 minutes to warm up properly.
17. Reduce engine speed to idle by pushing inward on throttle control (Figure 5, Item 2). APU (Figure 5, Item 4) is ready for normal operation.
18. Allow APU (Figure 5, Item 4) to run continuously for at least 30 minutes to recharge APU battery whenever operations permit.
19. Run APU (Figure 5, Item 4) until all PMCS tasks are completed, if it has been started for PMCS. This is especially important if the semitrailer has been stored and the APU has not been started for several days or if the weather is cold.



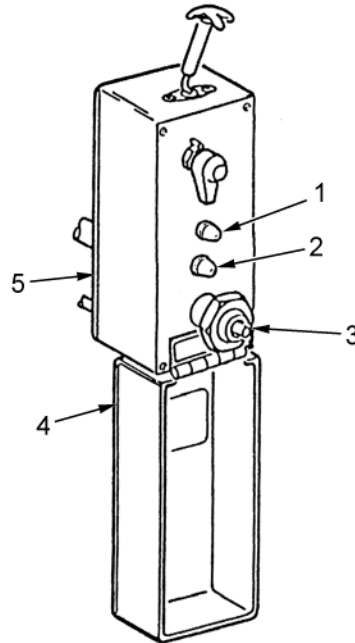
HETT0821

Figure 5. APU Startup.

END OF TASK

APU SHUTDOWN

1. Push in throttle control (Figure 6, Item 3) completely to stop APU (Figure 6, Item 5).
2. Ensure low oil pressure indicator light (Figure 6, Item 2) and glow plug indicator (Figure 6, Item 1) are not lit.
3. Close cover (Figure 6, Item 4) to APU control box (Figure 6, Item 5).



HETT0820

Figure 6. APU Shutdown.

WARNING

On some semitrailers, a solar battery charger is mounted on top of the gooseneck directly in front of the spare tires. Persons working on top of the gooseneck must take **EXTREME care not to step on or trip over it. Failure to follow this warning may result in injury to personnel or damage to equipment.**

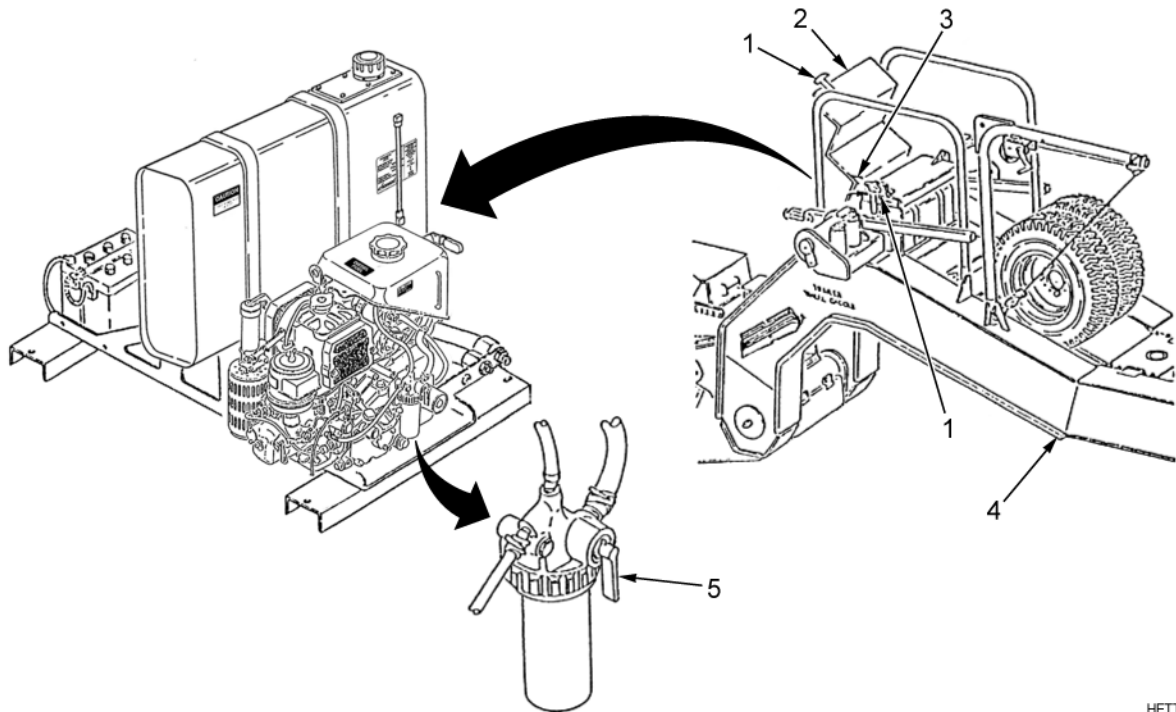
NOTE

- Steps 4 through 7 below apply only if the semitrailer is to be placed in extended (short or long term) storage.
 - The fuel petcock is shown in the open position.
4. At rear of gooseneck (Figure 7, Item 4), unhook step retainer (Figure 7, Item 1) from step section (Figure 7, Item 2) and raise step section up and forward.
 5. Secure step section (Figure 7, Item 2) by hooking top step retainer (Figure 7, Item 1) to strap (Figure 7, Item 3) on step section.

NOTE

The fuel petcock is shown in the open position.

6. Turn fuel petcock (Figure 7, Item 5) counterclockwise to closed position.
7. Unhook strap (Figure 7, Item 3) from retainer (Figure 7, Item 1) and lower step section (Figure 7, Item 2) to normal position. Secure step section in place by hooking step retainer to catch on fixed bottom step section.



HETT721

Figure 7. APU Shutdown.

8. Remove four wheel chocks (Figure 8, Item 3) from each dual outer tire (Figure 8, Item 2) of No. 1 bogie (Figure 8, Item 4).
9. Stow four wheel chocks (Figure 8, Item 3) in gooseneck (Figure 8, Item 1).

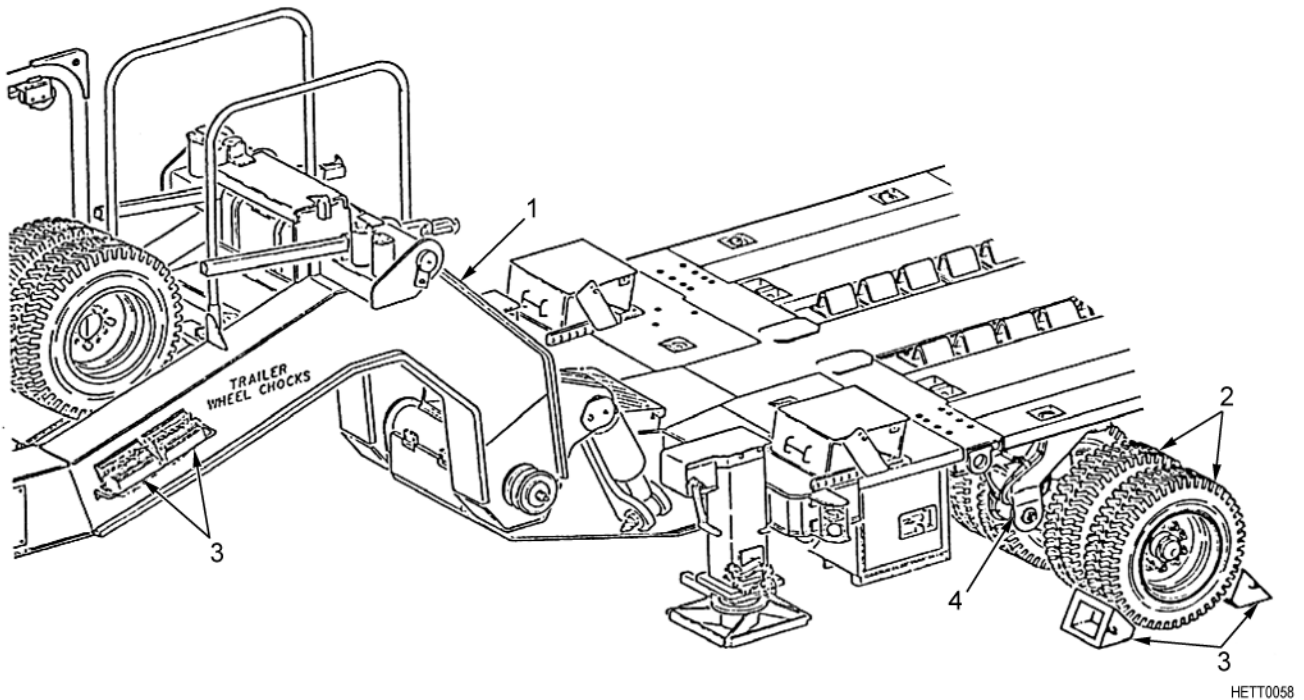


Figure 8. APU Shutdown.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**OPERATION UNDER USUAL CONDITIONS - AUXILIARY POWER UNIT (APU) COLD WEATHER STARTING**

INITIAL SETUP:**Personnel Required**

2

References

WP0005

WP0021

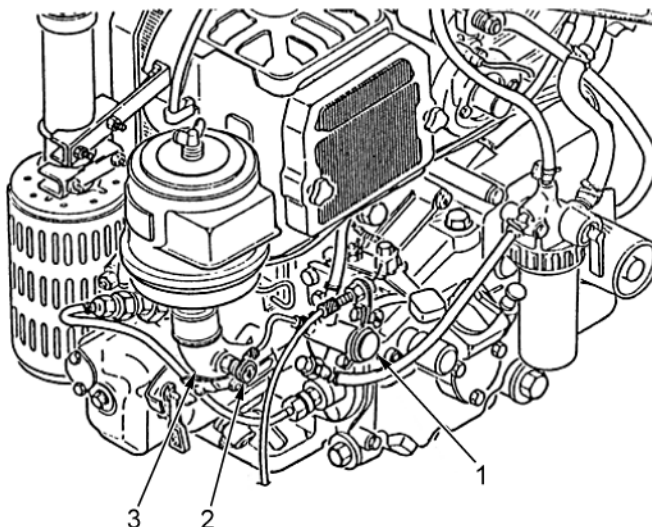
GENERAL INFORMATION

This work package contains instructions for the Heavy Equipment Transporter (HET) semitrailer Auxiliary Power Unit (APU) cold weather starting.

AUXILIARY POWER UNIT (APU) COLD WEATHER STARTING**NOTE**

The following procedures apply when ambient temperatures range from 40 to -25°F (4 to -31°C). When the temperature is below -25°F (-31°C), refer to Arctic Weather APU Starting (WP 0021).

1. Perform steps 1 through 6 of Auxiliary Power Unit (APU) Startup and Shutdown (WP 0005).
2. Prime jet start (Figure 1, Item 3) by pulling jet start valve knob (Figure 1, Item 1) out with jet start petcock (Figure 1, Item 2) closed. If jet start valve knob does not remain out, check that jet start petcock is fully closed, and then pull jet start valve knob again.
3. With aid of an assistant, perform steps 7 through 14 in APU Startup (WP 0005).
4. Turn jet start petcock (Figure 1, Item 2) counterclockwise to open when APU starts to crank over.
5. Pump jet start valve (Figure 1, Item 1) three times to prime APU. A few additional pumps may be necessary before engine runs smoothly.
6. Turn jet start petcock (Figure 1, Item 2) clockwise to close once engine is running smoothly. Secure step section in its normal position. Refer to APU Startup (WP 0005), step 6. Continue startup procedure. Refer to APU Startup (WP 0005), steps 15 through 18.



HETT0062

Figure 1. APU Cold Weather Starting.

END OF TASK**END OF WORK PACKAGE**

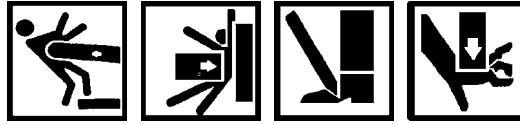
FIELD MAINTENANCE**OPERATION UNDER USUAL CONDITIONS - ADJUSTING GOOSENECK**

INITIAL SETUP:

References	WP 0011
WP 0005	WP 0013

GENERAL INFORMATION

This work package contains instructions for adjusting the gooseneck of the Heavy Equipment Transporter (HET) semitrailer.

ADJUSTING GOOSENECK**WARNING**

- Prior to adjusting the gooseneck height, ensure that both the gooseneck isolation and the suspension SHUTOFF valve handles have been pulled outward to the ADJUST position.
 - If the gooseneck needs adjusting, verify that the front support legs are lowered and supporting the platform.
- Failure to follow this warning may result in injury to personnel.

CAUTION

If the semitrailer is coupled to the tractor, DO NOT attempt to adjust the gooseneck or damage to equipment may result.

1. Start Auxiliary Power Unit (APU) (WP 0005). Ensure that APU throttle control is pulled out completely and APU is running at full speed.
2. Uncouple tractor and semitrailer (WP 0013).
3. Check that front support legs are lowered and supporting platform (WP 0011).
4. Ensure gooseneck isolation valve handle (Figure 1, Item 2) and suspension SHUTOFF valve handle (Figure 1, Item 3) are pulled outward, as far as they will go, to ADJUST position.
5. Pull up handle of gooseneck valve (Figure 1, Item 4) to raise gooseneck (Figure 1, Item 1). Once gooseneck reaches highest position and stops, release handle of gooseneck valve.
6. Push down handle of gooseneck valve (Figure 1, Item 4) to lower gooseneck (Figure 1, Item 1). Once gooseneck reaches lowest position and stops, release handle of gooseneck valve.

NOTE

When the gooseneck is raised to an intermediate height, it may travel 1 to 3 in. (2.5 to 7.6 cm) upward after the handle is released. This is caused by air trapped in the cylinder and may be stopped immediately by momentarily moving the handle to the down position. If traveling occurs, it may be minimized by operating the gooseneck from full-up to full-down for two full cycles.

7. Raise or lower gooseneck (Figure 1, Item 1) to any desired height.
8. If semitrailer is going to be parked, lower gooseneck (Figure 1, Item 1) by pushing handle of gooseneck valve (Figure 1, Item 4) until gooseneck reaches lowest position and stops; then, release handle of gooseneck valve.
9. After gooseneck (Figure 1, Item 1) adjustments are complete, shut down APU (WP 0005).

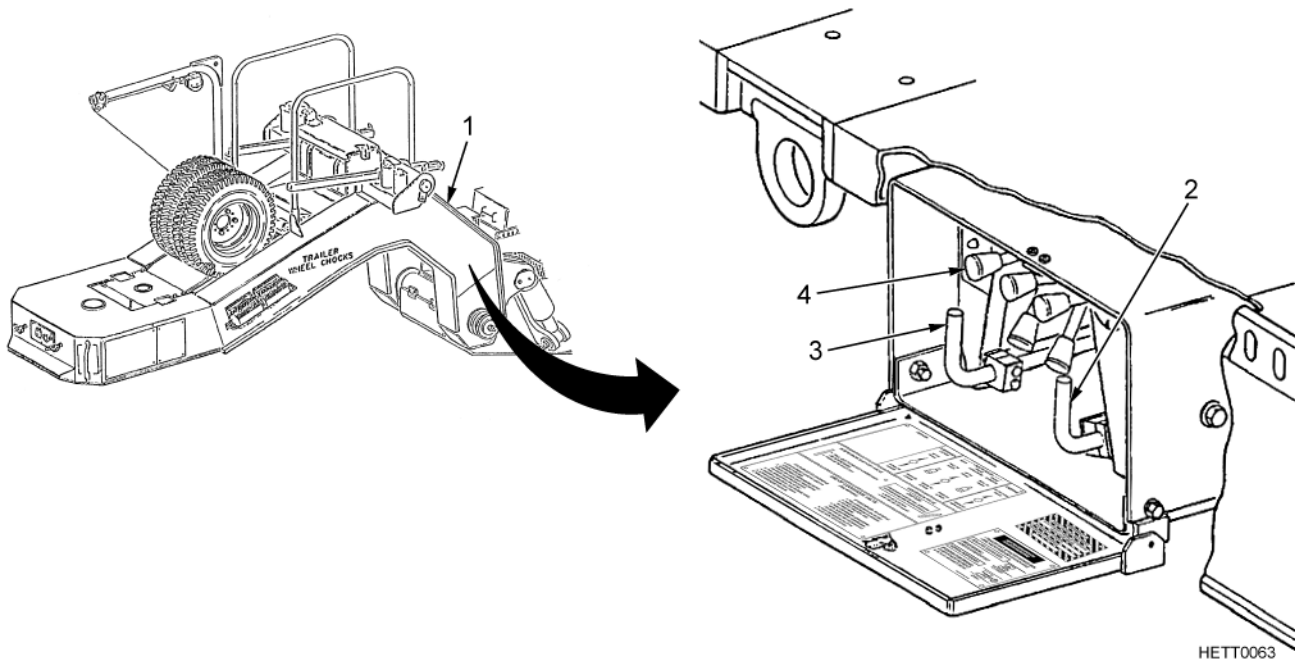


Figure 1. Adjusting Gooseneck.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**OPERATION UNDER USUAL CONDITIONS - ADJUSTING PLATFORM HEIGHT**

INITIAL SETUP:**Personnel Required**

2

WP 0007

WP 0008

References

WP 0004

WP 0005

WP 0011

WP 0012

GENERAL INFORMATION

This work package contains instructions for adjusting the platform height of the Heavy Equipment Transporter (HET) semitrailer.

ADJUSTING PLATFORM HEIGHT**CAUTION**

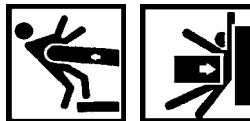
If the semitrailer is loaded, **DO NOT** make any platform adjustments while it is uncoupled or severe damage to equipment may result.

1. Start and run Auxiliary Power Unit (APU) at full throttle. Refer to APU Startup and Shutdown (WP 0005).

CAUTION

The suspension **SHUTOFF** valve handle must be pulled outward to the **ADJUST** position prior to operating any platform/gooseneck valve handles. The suspension **SHUTOFF** valve isolates the suspension and prevents operation. If the valve handle is not properly positioned for intended operation, severe damage to equipment may result.

2. Pull out handle of suspension **SHUTOFF** valve (Figure 1, Item 2) to **ADJUST** position (WP 0004).

WARNING

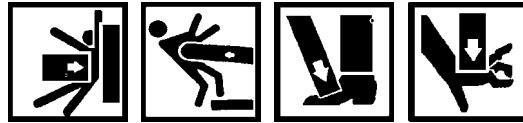
Ensure both streetside and curbside front bogie wheels are chocked. After the parking brakes are released, the semitrailer may roll uncontrolled.

Failure to follow this warning may result in injury to personnel or damage to equipment.

NOTE

The brakes on the semitrailer should be released when making platform adjustments. If the parking brakes are not released, platform adjustments will be much slower and more difficult to accomplish.

3. If semitrailer is coupled, release semitrailer parking brakes. If semitrailer is uncoupled and semitrailer air tanks contain sufficient air, push in knob of brake release valve to release brakes (WP 0004).

WARNING

If the semitrailer is coupled to a tractor, the gooseneck isolation valve handle must be in the RUN position (handle pushed inward). If the semitrailer is uncoupled and the gooseneck needs adjusting, verify that the front support legs are lowered and supporting the platform and that all personnel are clear of the gooseneck before operating the gooseneck isolation valve. Failure to follow this warning may result in injury to personnel.

4. If semitrailer is uncoupled and gooseneck (Figure 1, Item 1) needs to be raised, ensure that handle of gooseneck isolation valve (Figure 1, Item 3) is in ADJUST position, handle pulled outward.
5. If semitrailer is coupled, ensure handle of gooseneck isolation valve (Figure 1, Item 3) is in RUN position, handle pushed inward.

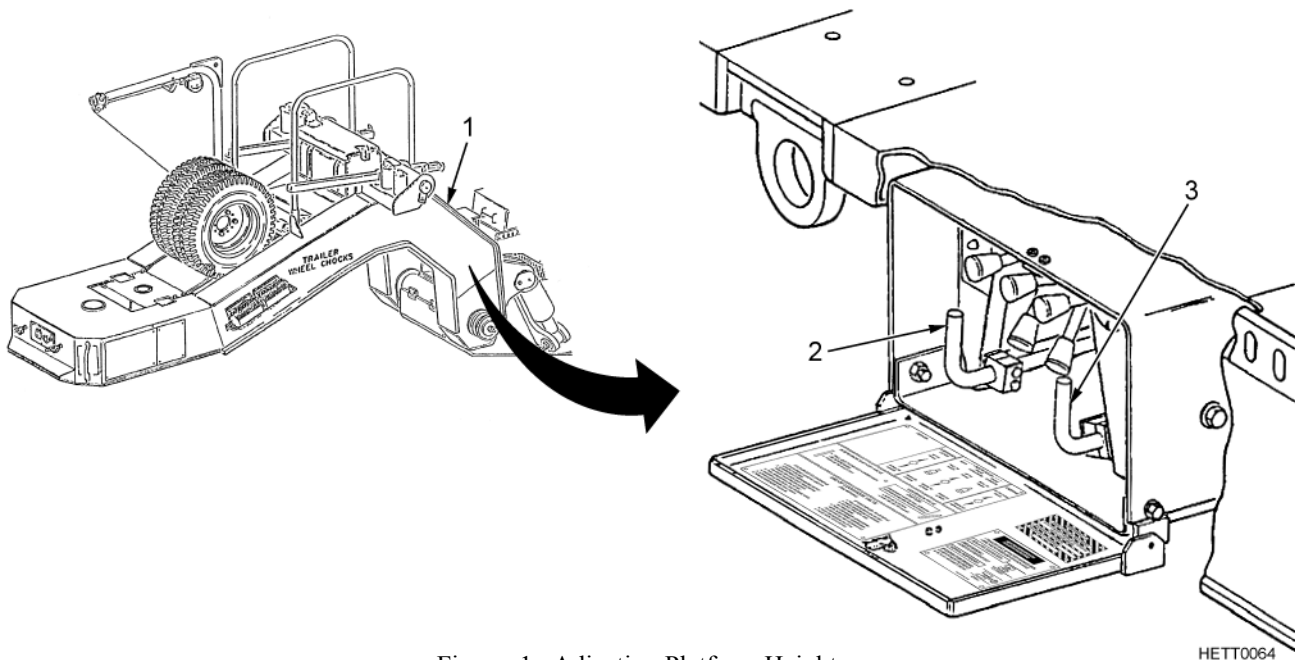


Figure 1. Adjusting Platform Height.

CAUTION

Wheel chocks must be moved away from tires prior to adjusting platform height or damage to wheel chocks or tires may result.

6. Move all four wheel chocks (Figure 2, Item 1) approximately 6 in. (15.24 cm) away from tires prior to adjusting platform.

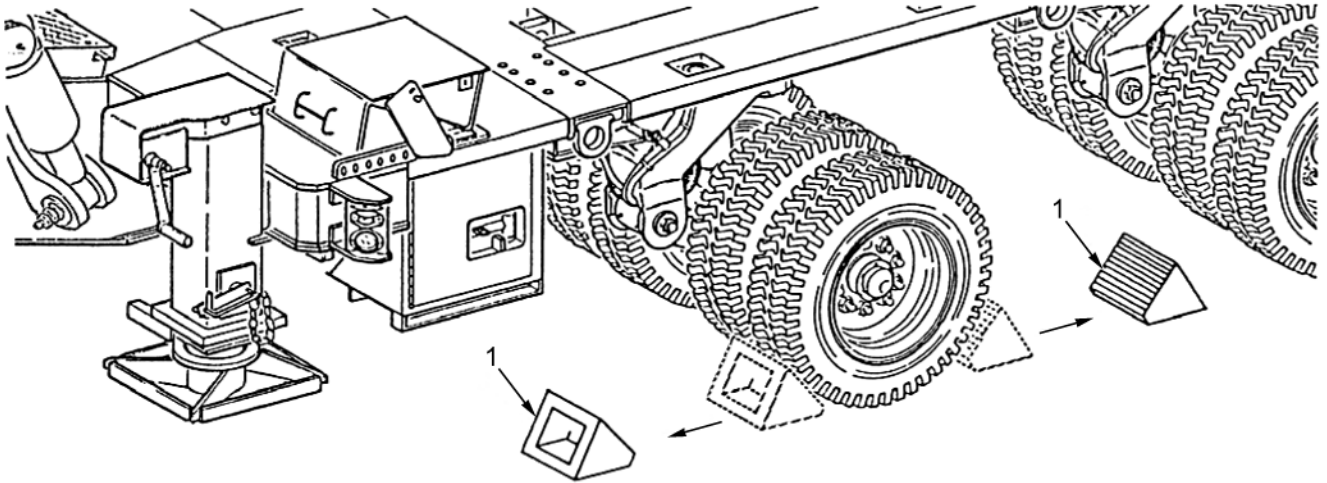


Figure 2. Adjusting Platform Height.

CAUTION

- **DO NOT** leave semitrailer unattended with suspension raised to highest position. Outside temperatures may cause thermal expansion of the hydraulic fluid and create unwanted pressure buildup without means to relieve pressure. Thermal expansion may cause premature failure or severe damage to equipment.
- **DO NOT** move semitrailer with suspension raised to its highest position. Individual bogies may sustain excess load, which may result in premature cylinder failure or severe damage to equipment.

NOTE

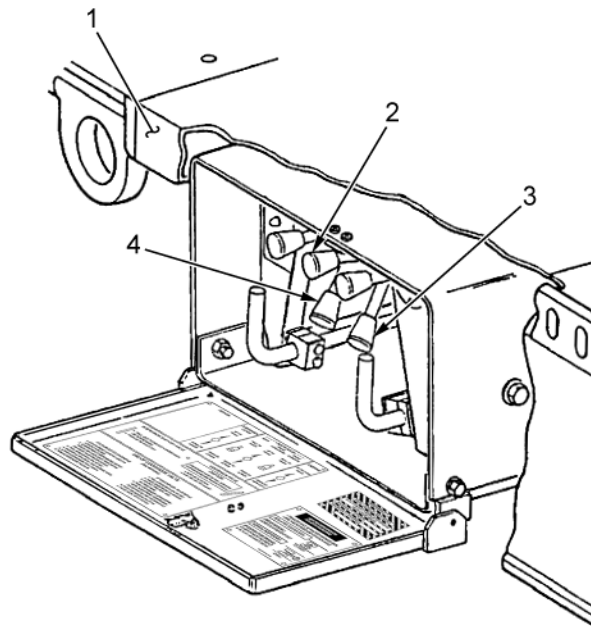
If the platform becomes uneven during adjustment, release the valve handle for the platform area that is leading the adjustment while holding the other two valve handles. Once the platform evens out, continue to operate all three valve handles to adjust platform.

7. To raise platform (Figure 3, Item 1), simultaneously pull up and hold handles of front curbside (Figure 3, Item 3), front streetside (Figure 3, Item 2), and rear (Figure 3, Item 4) suspension valves. Once platform reaches highest position, has stopped, and APU rpm decreases, release all three valve handles.

CAUTION

DO NOT allow suspension to completely bottom out in the lowest position (unless otherwise directed by specific operation or maintenance procedures) or individual bogies may sustain excess load and result in premature cylinder failure or severe damage to equipment. To ensure proper suspension pressure equalization, lower platform until the shortest (compression) suspension cylinder piston still has 1 in. (2.54 cm) of polished chrome exposed. Failure to follow this caution may result in damage to equipment.

8. To lower platform (Figure 3, Item 1), push down and hold rear suspension valve handle (Figure 3, Item 4).
9. Once rear of platform (Figure 3, Item 1) starts to lower, push down and hold front curbside suspension valve handle (Figure 3, Item 3) and front streetside suspension valve handle (Figure 3, Item 2).
10. Once platform (Figure 3, Item 1) reaches lowest suggested height, release all three suspension valve handles (Figure 3, Item 2, Item 3, and Item 4).



HETT0066

Figure 3. Adjusting Platform Height.

NOTE

If the semitrailer is uncoupled, difficulty in lowering the rear of the platform may be experienced due to the offset weight of the gooseneck. Perform steps 11 through 15 if this problem occurs.

11. Raise platform (Figure 4, Item 1) to normal running height of 43 in. (109.22 cm) (refer to step 6 above), and lower both front support legs (WP 0011) to support platform at running height.
12. Push down and hold rear valve handle (Figure 4, Item 4). As rear of platform (Figure 4, Item 1) starts to lower, push down front curbside suspension valve handle (Figure 4, Item 3) and front streetside suspension valve handle (Figure 4, Item 2).

NOTE

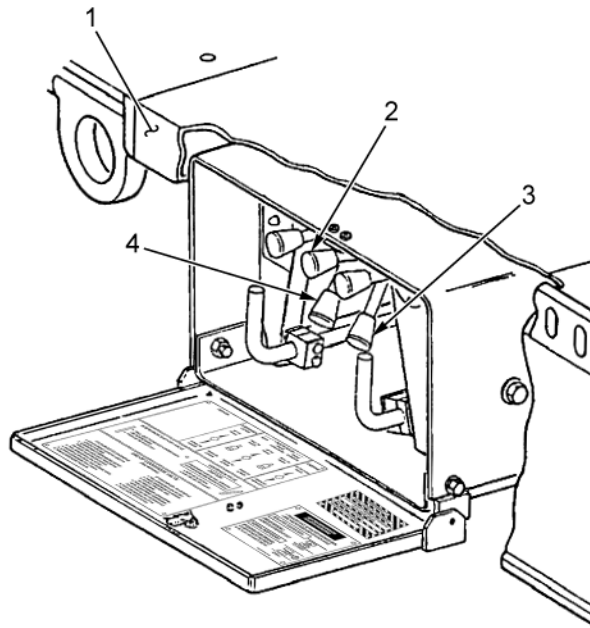
As front support legs contact the ground, continue to hold all three valve handles down as rear of platform goes down.

13. Pull up front curbside suspension valve handle (Figure 4, Item 3) and front streetside suspension valve handle (Figure 4, Item 2) to raise front of platform (Figure 4, Item 1).

NOTE

When front of platform is high enough to stow front support legs, release both suspension valve handles.

14. Raise and secure front support legs. Refer to Operating Front Support Legs (WP 0011).
15. Push down and hold all three valve handles for front streetside (Figure 4, Item 2), curbside (Figure 4, Item 3), and rear valves (Figure 4, Item 4) until platform (Figure 4, Item 1) reaches recommended lowest height.



HETT0066

Figure 4. Adjusting Platform Height.

16. After lowering platform is complete, evenly raise platform (step 6 above) and lower platform (steps 7 through 9 above).
17. With aid of an assistant, check bed height indicators on each of three suspension assemblies (WP 0004).
18. With aid of another assistant, make adjustments to the platform as needed. Level the platform to a normal road height of 43 in. (109 cm) (WP 0008).
19. Lower front and rear support legs to support platform (WP 0011 and WP 0012).
20. Lower platform onto support legs. Refer to steps 11 and 12 above.

NOTE

Perform steps 21 through 23 after all platform adjustments are complete.

21. If semitrailer is to be parked uncoupled, lower gooseneck (Figure 5, Item 1) to lowest position (WP 0007).
22. Push in handles of suspension SHUTOFF valve (Figure 5, Item 2) and gooseneck isolation valve (Figure 5, Item 3), as far as they will go, to SHUTOFF and RUN positions.
23. Shut down APU (WP 0005).

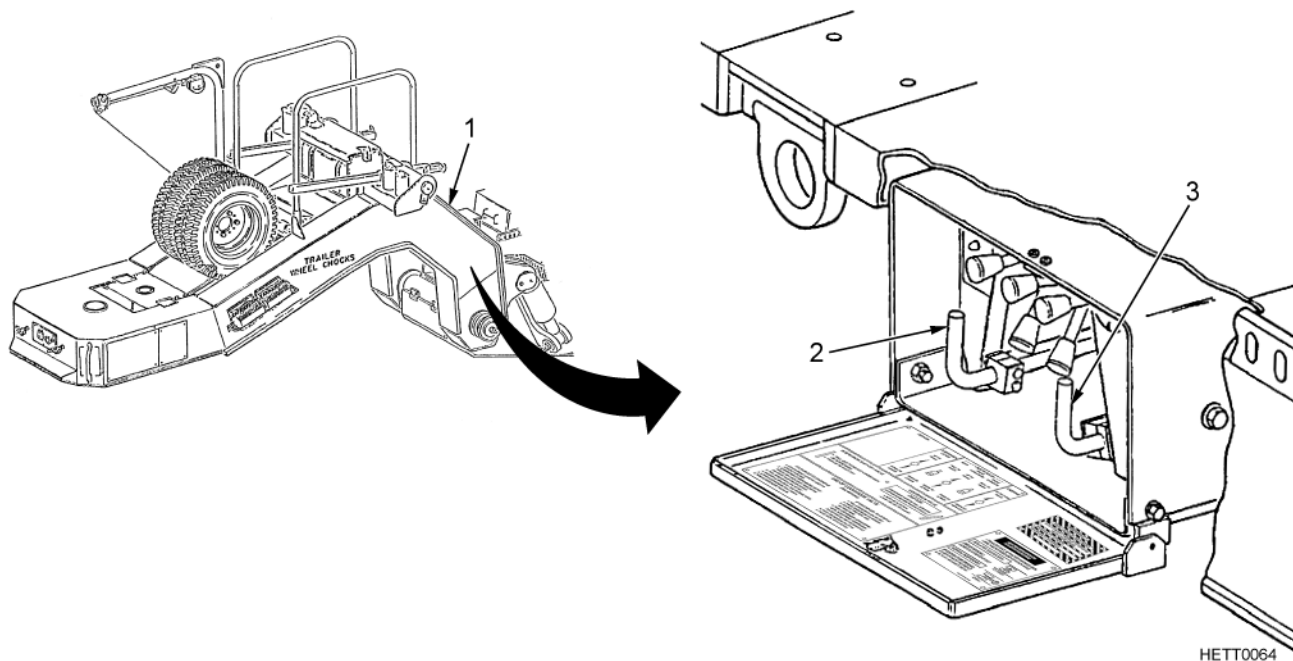
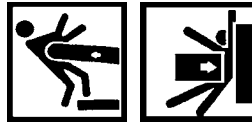


Figure 5. Adjusting Platform Height.

WARNING

Ensure that vented dummy coupling is installed on the emergency (red) gladhand prior to releasing brakes with the brake release valve. If a nonvented dummy coupling is installed, the parking brakes cannot be reapplied and injury to personnel may result.

NOTE

Reapply semitrailer parking brakes using semitrailer brake valve on tractor, if coupled.

24. Apply brakes on semitrailer by pulling knob on brake release valve outward (WP 0004). If no other braking applications are required, install dummy coupling onto emergency gladhand (WP 0004).
25. Place wheel chocks (Figure 6, Item 2) in front of and behind tires (Figure 6, Item 1).

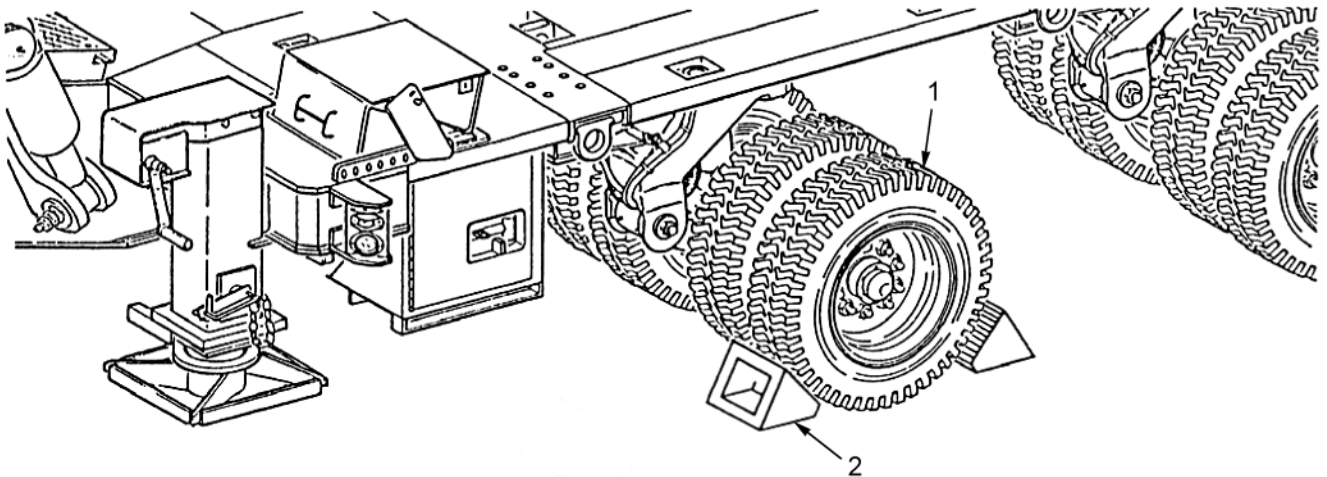


Figure 6. Adjusting Platform Height.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**OPERATION UNDER USUAL CONDITIONS - OPERATING LOADING RAMPS**

INITIAL SETUP:**Personnel Required**2

GENERAL INFORMATION

This work package contains instructions for operating the loading ramps of the Heavy Equipment Transporter (HET) semitrailer.

ADJUSTING LOADING RAMPS

WARNING



When the ramp stow chains are disconnected from the platform, DO NOT stand behind the ramps or near the path the ramps can travel when being lowered or raised. Failure to follow this warning may result in serious injury to personnel.

NOTE

- The loading ramps may require span width adjustment to accommodate the intended payload. If ramps require adjustment, perform steps 1 through 4.
 - Adjustments must be accomplished prior to lowering the ramps.
 - If the ramps DO NOT require adjustment, proceed to the Lowering Loading Ramps procedure (below).
 - Both loading ramps are adjusted the same way. Adjust the ramps one at a time.
1. Release snap (Figure 1, Item 2) and load binder (Figure 1, Item 3). Remove stow chain hook (Figure 1, Item 4) from slotted hole (Figure 1, Item 10) in platform (Figure 1, Item 1).
 2. Connect stow chain hook (Figure 1, Item 4) to aft set of International Standards Organization (ISO) container brackets mounting hole (Figure 1, Item 5). Close load binder (Figure 1, Item 3).
 3. Remove hitch pins (Figure 1, Item 9) and crowbar (Figure 1, Item 7) from rear of platform (Figure 1, Item 6).
 4. Reinstall hitch pins (Figure 1, Item 9) to retain remaining isolation valve handle extension (Figure 1, Item 8).

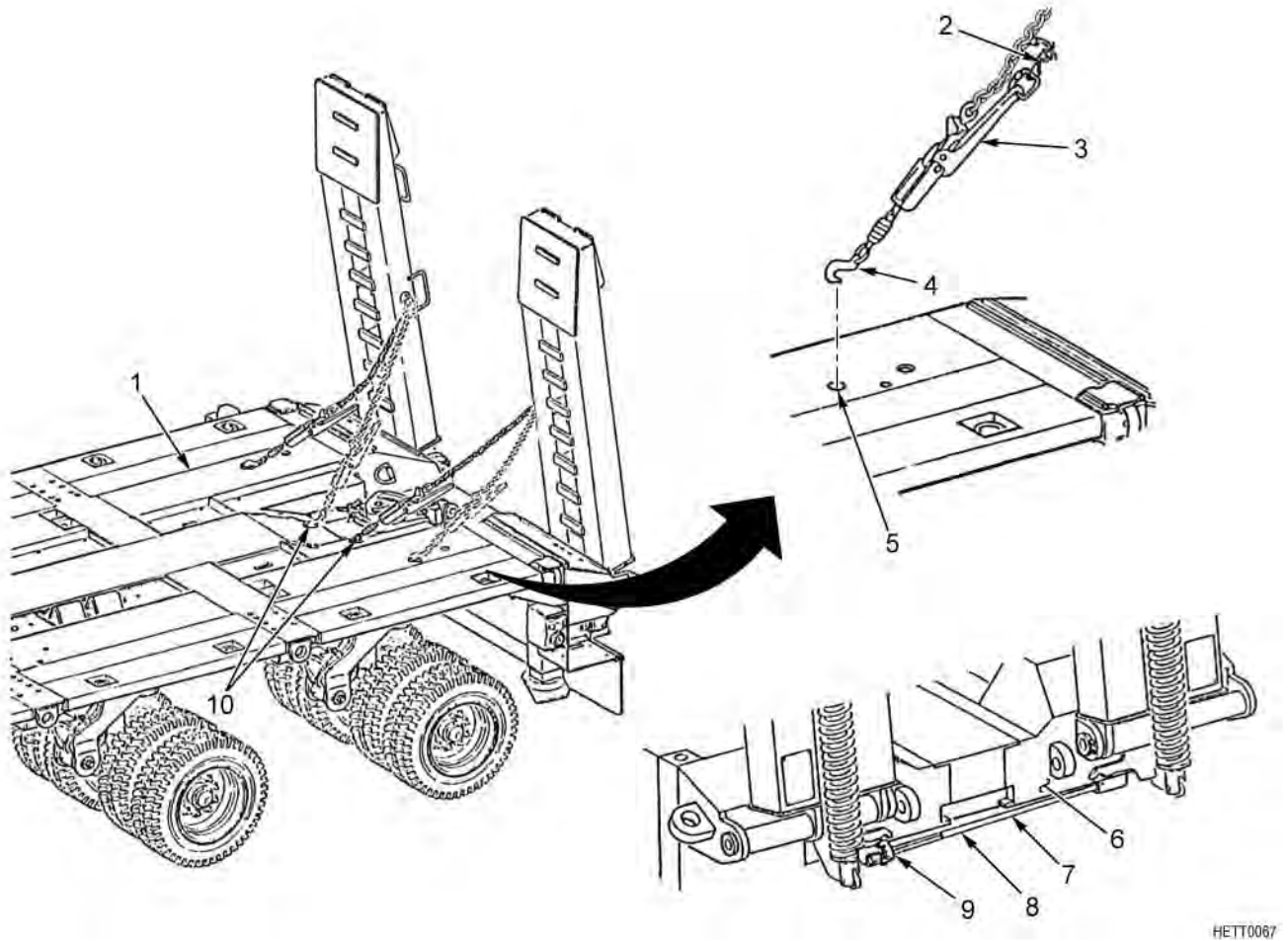
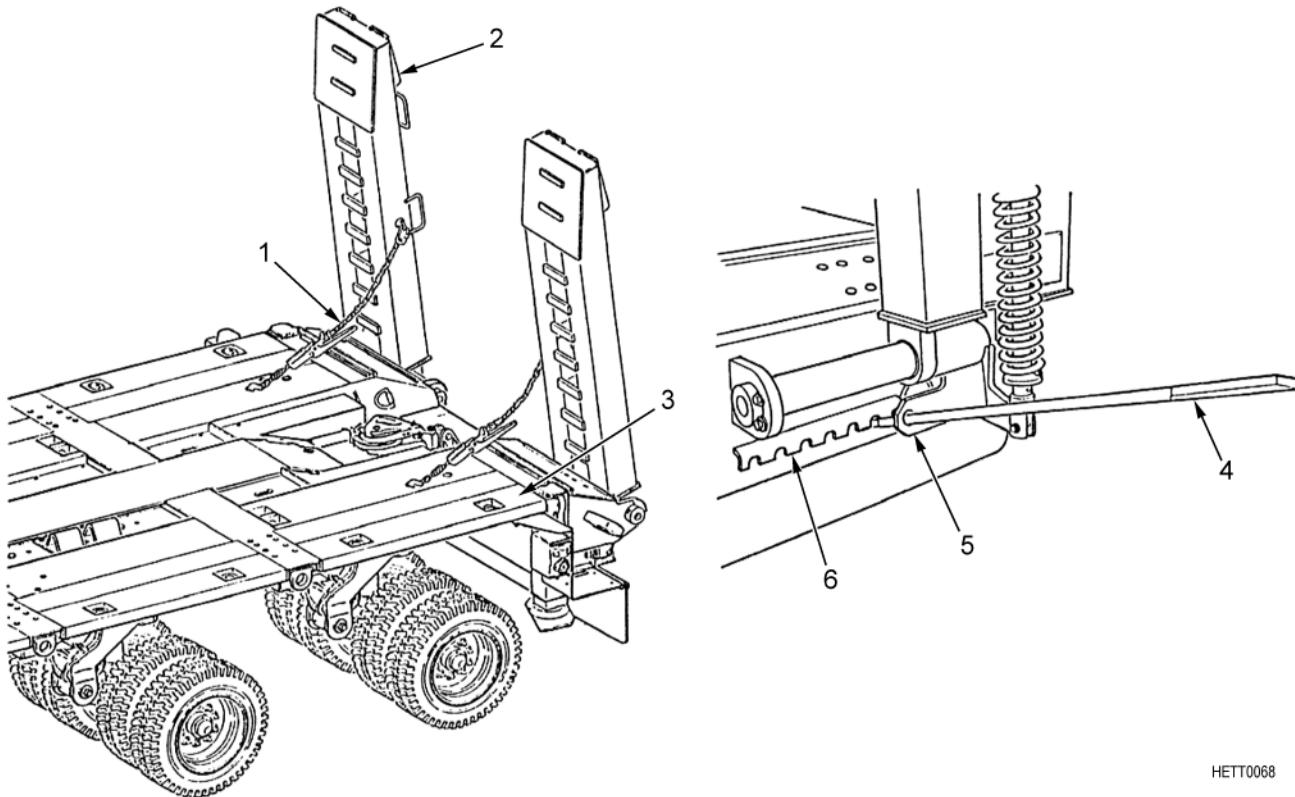


Figure 1. Adjusting Loading Ramps.

5. Insert small end of crowbar (Figure 2, Item 4) in ramp lift lever (Figure 2, Item 5) and bar strip (Figure 2, Item 6).
6. With aid of an assistant, position one person on rear of platform (Figure 2, Item 3) to push ramp (Figure 2, Item 2) rearward against stow chain (Figure 2, Item 1) until ramp is perpendicular to platform.
7. Second person must push or pull on crowbar (Figure 2, Item 4) in direction required to slide ramp (Figure 2, Item 2) outboard from center.
8. Continue to place crowbar (Figure 2, Item 4) in holes along bar strip (Figure 2, Item 6) and move ramp (Figure 2, Item 2) to furthest outboard position.
9. Repeat steps 1 through 8 above to adjust remaining ramp (Figure 2, Item 2).



HETT0068

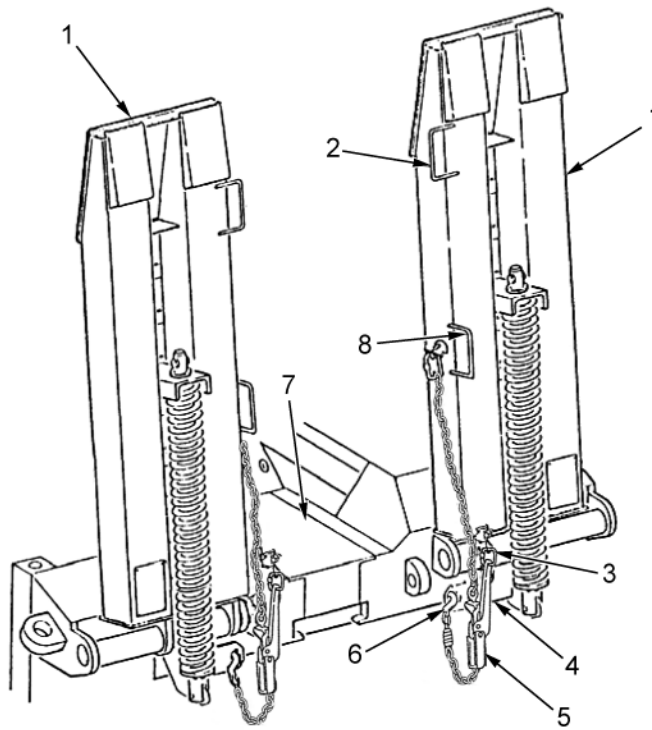
Figure 2. Adjusting Loading Ramps.

END OF TASK

LOWERING LOADING RAMPS**NOTE**

Both loading ramps are lowered the same way. Lower ramps one at a time.

1. Open snap (Figure 3, Item 3) and load binder (Figure 3, Item 5).
2. Remove stow chain hook (Figure 3, Item 6) from platform (Figure 3, Item 7) and attach hook into hole in ramp lever (Figure 3, Item 4). Close load binder (Figure 3, Item 5).
3. Standing behind platform (Figure 3, Item 7), between both ramps (Figure 3, Item 1), grasp lower handle (Figure 3, Item 8) on loading ramp and pull downward.
4. As ramp (Figure 3, Item 1) swings downward, grasp upper handle (Figure 3, Item 2) and apply pressure until ramp angle is below horizontal; then, push down until ramp is on ground.
5. Perform steps 1 through 4 above to lower other ramp (Figure 3, Item 1).



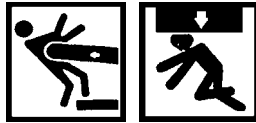
HETT0069

Figure 3. Lowering Loading Ramps.

END OF TASK

RAISING LOADING RAMPS

WARNING

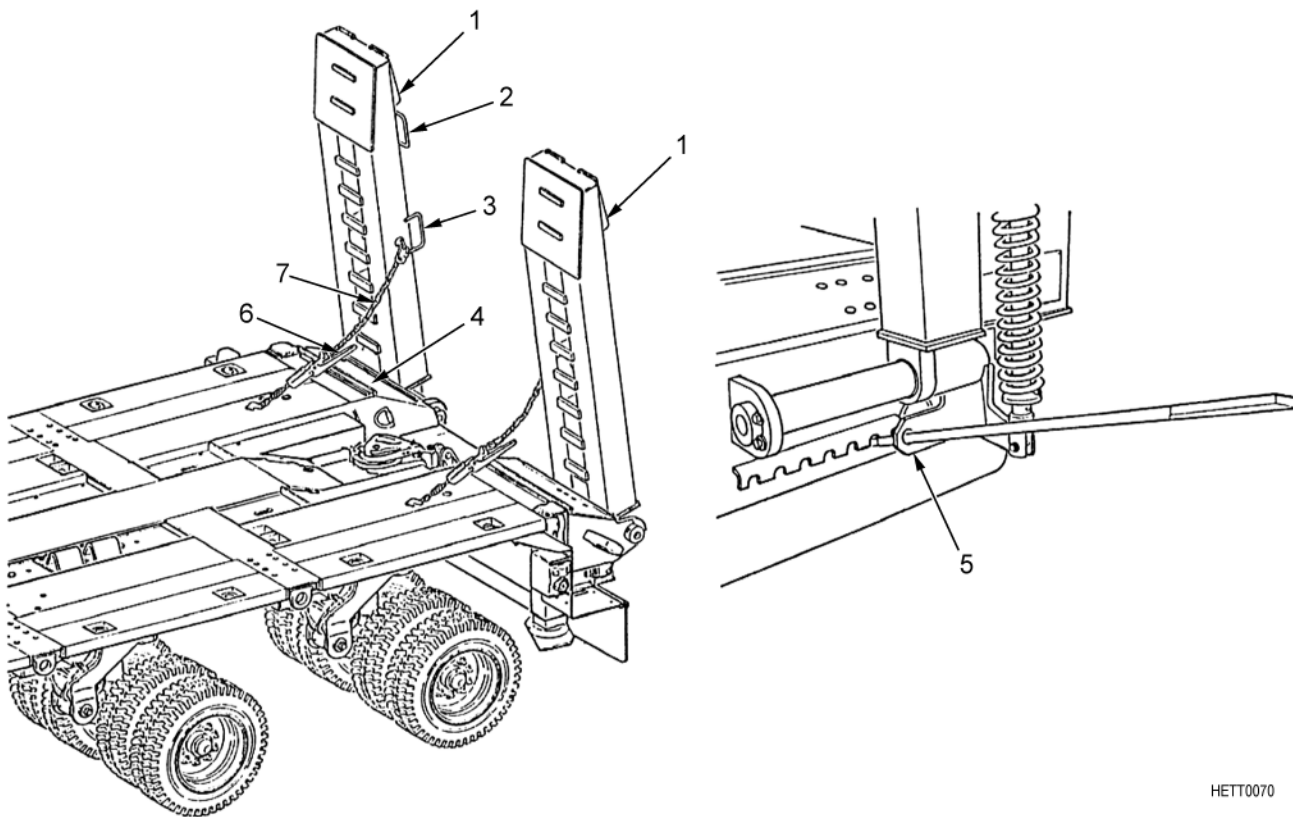


The spring-assisted ramps, when raised from the lowered position, are under extreme tension and rise very quickly. When raising ramps, **DO NOT** stand on the beavertail or in the path where any portion of the ramp will travel during upward travel. Failure to follow this warning may result in injury to personnel.

NOTE

Both loading ramps are raised the same way. Raise loading ramps one at a time.

1. Grasp upper handle (Figure 4, Item 2) on ramp (Figure 4, Item 1) and pull upward.
2. Release upper handle (Figure 4, Item 2) as ramp (Figure 4, Item 1) passes horizontal position and continues to raise from spring tension.
3. Grasp lower handle (Figure 4, Item 3) and apply pressure until ramp (Figure 4, Item 1) is firmly against beavertail (Figure 4, Item 4).
4. Open load binder (Figure 4, Item 6) and unhook stow chains (Figure 4, Item 7) from ramp lifting lever (Figure 4, Item 5).



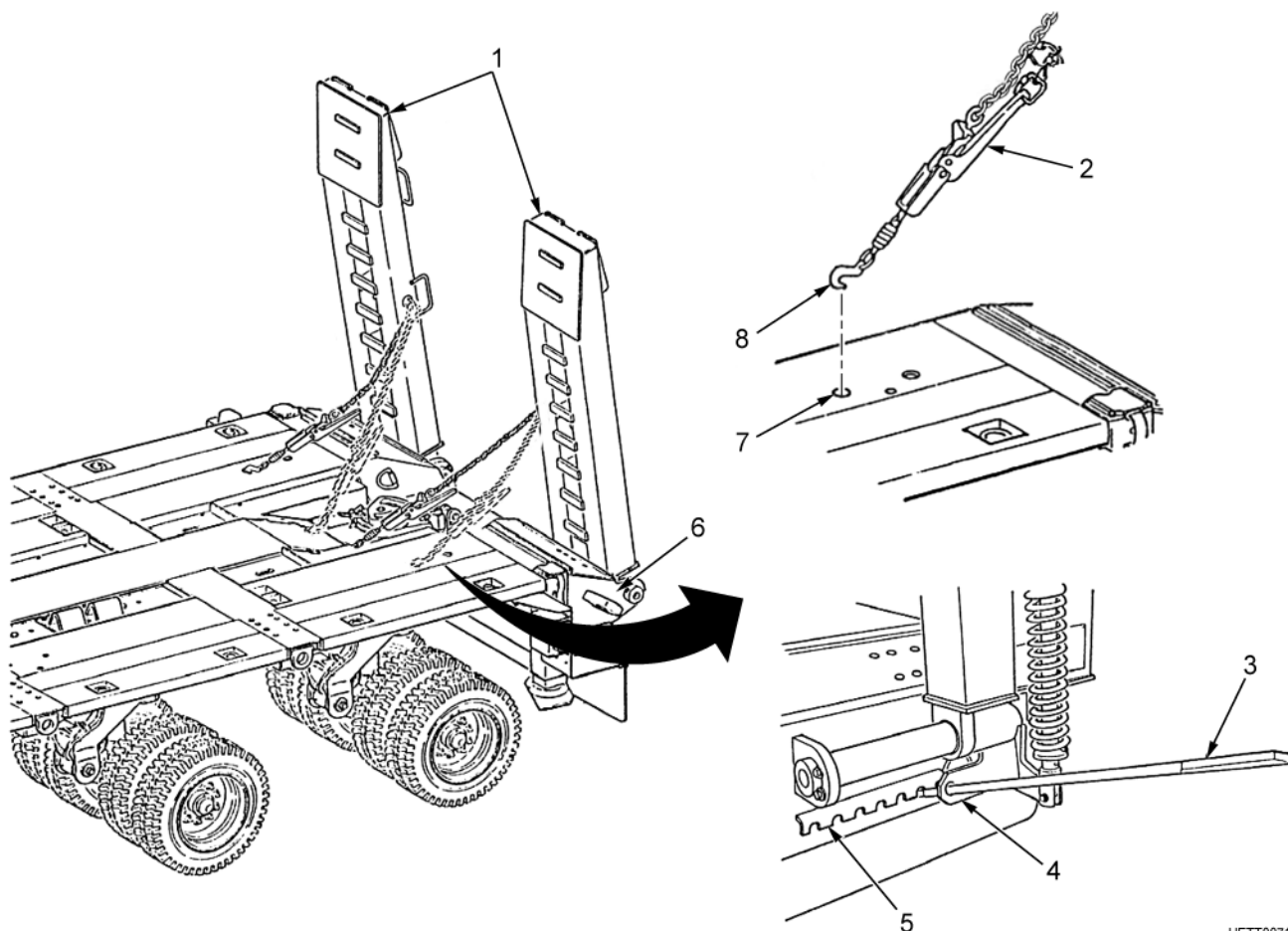
HETT0070

Figure 4. Raising Loading Ramp.

NOTE

- Ramps must be adjusted to furthest inward position prior to stowing for transport.
- If ramps require adjustment, perform steps 1 through 4 of Adjusting Loading Ramps (above).
If no adjustment is required, proceed to step 5 below.

5. Connect stow chain hook (Figure 5, Item 8) to foremost (large) mounting hole (Figure 5, Item 7).
6. Close load binder (Figure 5, Item 2).
7. Insert small end of crowbar (Figure 5, Item 3) through hole in ramp lift lever (Figure 5, Item 4) in bar strip (Figure 5, Item 5).
8. With aid of an assistant, position a person on rear of platform (Figure 5, Item 6) to push ramp (Figure 5, Item 1) rearward until it is perpendicular to platform.
9. Second person must push or pull on crowbar (Figure 5, Item 3) in direction required to slide ramp (Figure 5, Item 1) inward.
10. Continue to place crowbar (Figure 5, Item 3) in holes along bar strip (Figure 5, Item 5) and move ramp (Figure 5, Item 1) to furthest inward position.
11. Repeat steps 1 through 10 above to raise other ramp (Figure 5, Item 1).



HETT0071

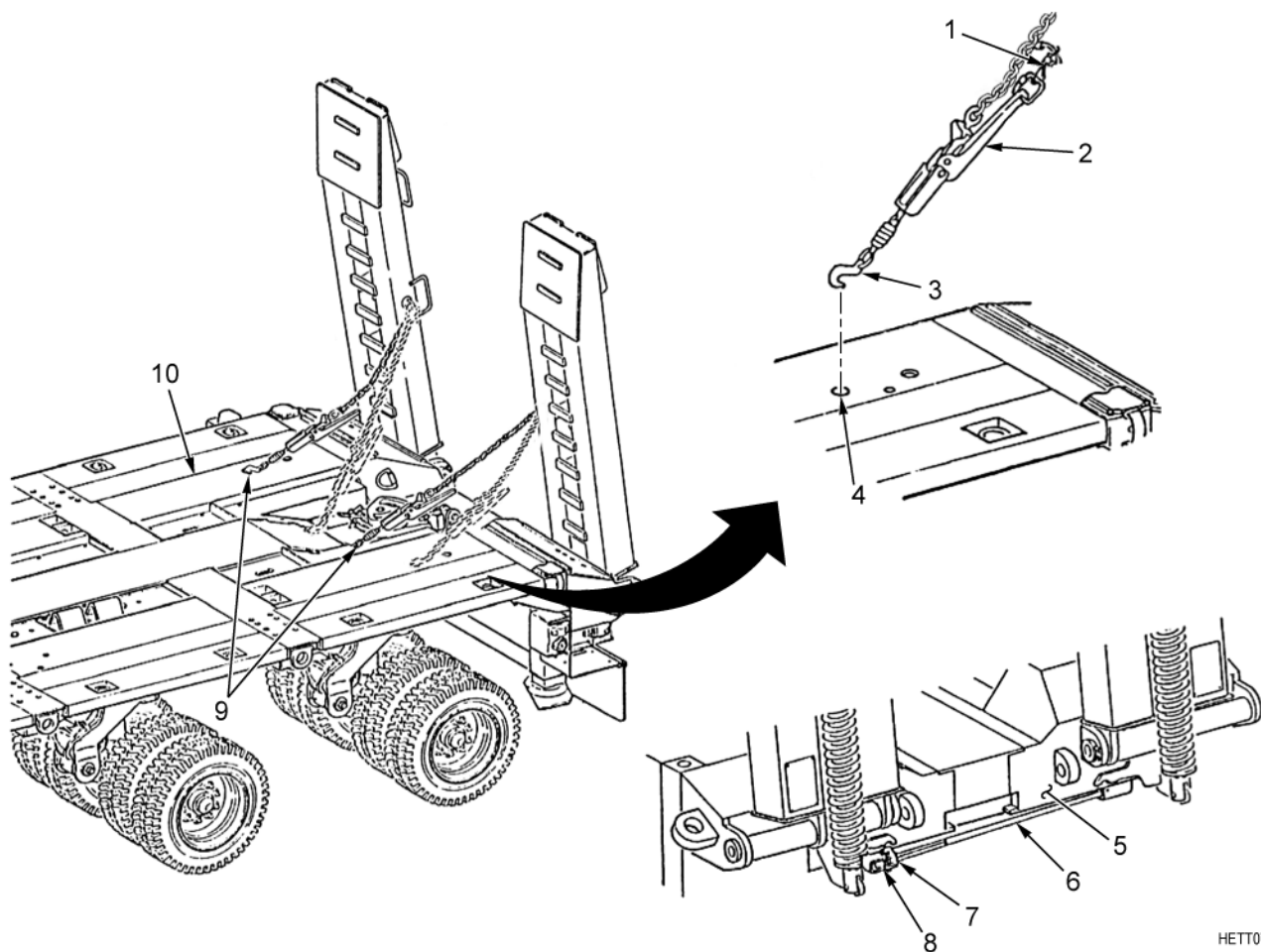
Figure 5. Raising Loading Ramp.

12. Open load binder (Figure 6, Item 2), remove stow chain hook (Figure 6, Item 3) from ISO container mounting bracket hole (Figure 6, Item 4), and connect chain hook at slotted holes (Figure 6, Item 9) in center of platform (Figure 6, Item 10).

NOTE

If chain sags with load binder closed, open load binder, remove quick link at end of chain, and shorten chain until there is no sag.

13. Close load binders (Figure 6, Item 2) and engage snap (Figure 6, Item 1) to prevent accidental opening.
14. Remove hitch pins (Figure 6, Item 7) from brackets (Figure 6, Item 8) and reinstall crowbar (Figure 6, Item 6) in brackets on rear of platform (Figure 6, Item 5). Reinstall hitch pins.



HETT0724

Figure 6. Raising Loading Ramp.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**OPERATION UNDER USUAL CONDITIONS - OPERATING MANUAL STEERING**

INITIAL SETUP:**Personnel**

1

References

WP 0004

WP 0005

WP 0013

GENERAL INFORMATION

This work package contains instructions for operating manual steering for the Heavy Equipment Transporter (HET) semitrailer.

OPERATING MANUAL STEERING

1. Start and run Auxiliary Power Unit (APU) (WP 0005).

CAUTION

- The suspension SHUTOFF valve handle must be pulled outward to the ADJUST position prior to operating any valve handles.
 - If the suspension SHUTOFF valve handle is not properly positioned for intended operation, severe damage to equipment may result.
2. Remove pins (Figure 1, Item 3) from access cover hasp (Figure 1, Item 2). Rotate access cover hasp and lower access cover (Figure 1, Item 6).
 3. Pull out suspension SHUTOFF valve handle (Figure 1, Item 5) to ADJUST position (WP 0004).

NOTE

- The brakes on the semitrailer should be released when making steering adjustments.
 - If the brakes are not released, steering adjustments will be much slower and more difficult to accomplish.
 - The parking brake may be released by one of the following methods listed in step 4 and step 5.
4. With tractor/semitrailer coupled, apply tractor parking brake and push in knob of brake release valve (Figure 1, Item 7) to release semitrailer parking brake.
 5. If uncoupled, push in knob of brake release valve (Figure 1, Item 7).

CAUTION

- If the tractor/semitrailer is uncoupled, manual steering may be used **ONLY** to move the steering wedge; however, manual steering of the wheels must not be attempted.
 - Manual steering without being coupled to a tractor may cause the steering arm to move to an extreme over-center position, which may be extremely difficult to recover and may cause damage to equipment.
6. Ensure that semitrailer is coupled to tractor and steering wedge is secured/tight in tractor fifth-wheel vee entry (WP 0013).

CAUTION

Wheel chocks must be moved away from tires prior to adjusting steering, or damage to chocks and tires may result.

7. Move four wheel chocks (Figure 1, Item 1) approximately 6 in. (15 cm) away from tires (Figure 1, Item 8) prior to adjusting steering.
8. Push down handle of steering valve (Figure 1, Item 4) to turn steerable bogies (Figure 1, Item 9) left. Once bogies turn completely left and stop, release handle of steering valve.

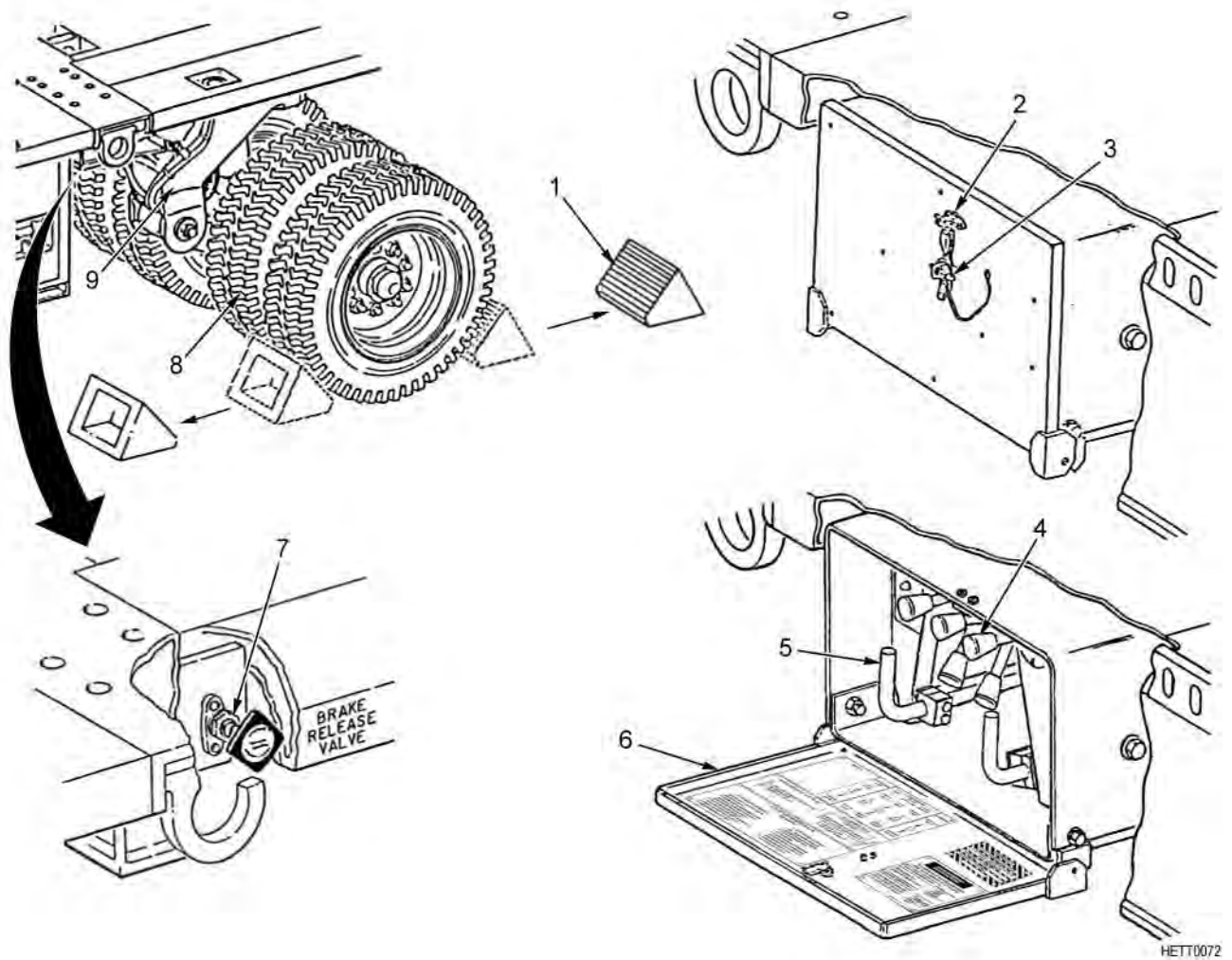


Figure 1. Operating Manual Steering.

9. Pull up handle of steering valve (Figure 2, Item 4) to turn steerable bogies (Figure 2, Item 9) right. Once bogies turn completely right and stop, release handle of steering valve.
10. Operate steering valve (Figure 2, Item 4) and return steerable bogies (Figure 2, Item 9) to approximately straight position (in line with kingpin facing forward).
11. If no other adjustments are required, perform steps 12 through 17 below.

WARNING



Ensure that vented dummy coupling is installed on the emergency (red) gladhand prior to releasing brakes with the brake release valve. If a nonvented dummy coupling is installed, the parking brakes cannot be reapplied. Failure to follow this warning may result in injury to personnel.

12. If coupled (tractor parking brakes applied), apply semitrailer parking brakes using semitrailer brake release valve (Figure 2, Item 7).

NOTE

If uncoupled, ensure that a vented dummy coupling is installed, or remove dummy coupling from emergency (red) gladhand.

13. Apply brakes on semitrailer by pulling knob on brake release valve (Figure 2, Item 7) outward.
14. Move wheel chocks (Figure 2, Item 1) back in place under tires (Figure 2, Item 8).
15. Push in handles of suspension SHUTOFF valve (Figure 2, Item 5) to SHUTOFF position.
16. Close access cover (Figure 2, Item 6), rotate hasp (Figure 2, Item 2) to secure access cover, and install pins (Figure 2, Item 3) in hasp.
17. Shut down APU (WP 0005).

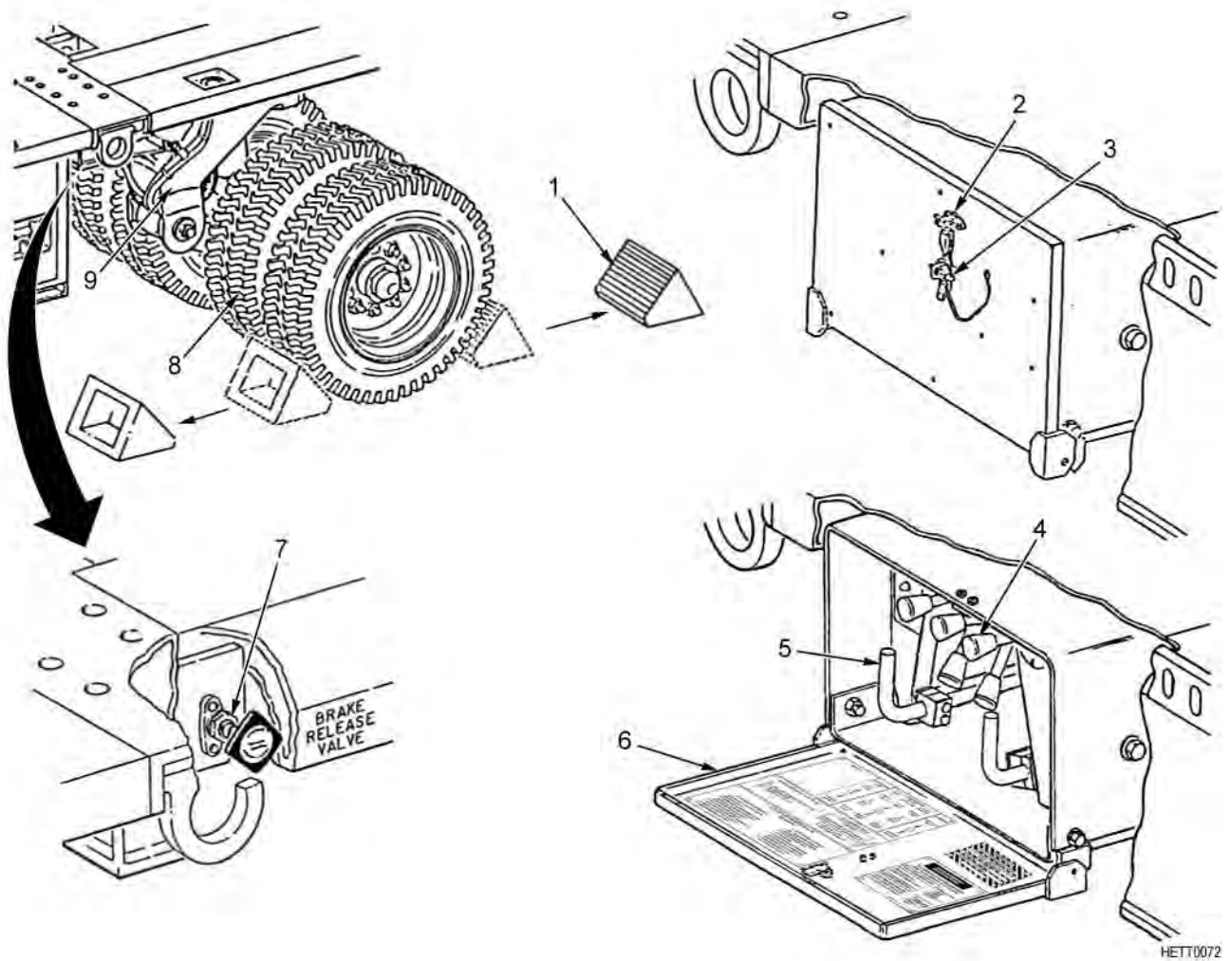


Figure 2. Operating Manual Steering.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**OPERATION UNDER USUAL CONDITIONS - OPERATING FRONT SUPPORT LEGS**

INITIAL SETUP:**Personnel Required**

1

References

WP 0004

WP 0005

WP 0008

GENERAL INFORMATION

This work package contains instructions for operating the front support legs of the Heavy Equipment Transporter (HET) semitrailer.

OPERATING FRONT SUPPORT LEGS

Lower Front Support Legs

WARNING



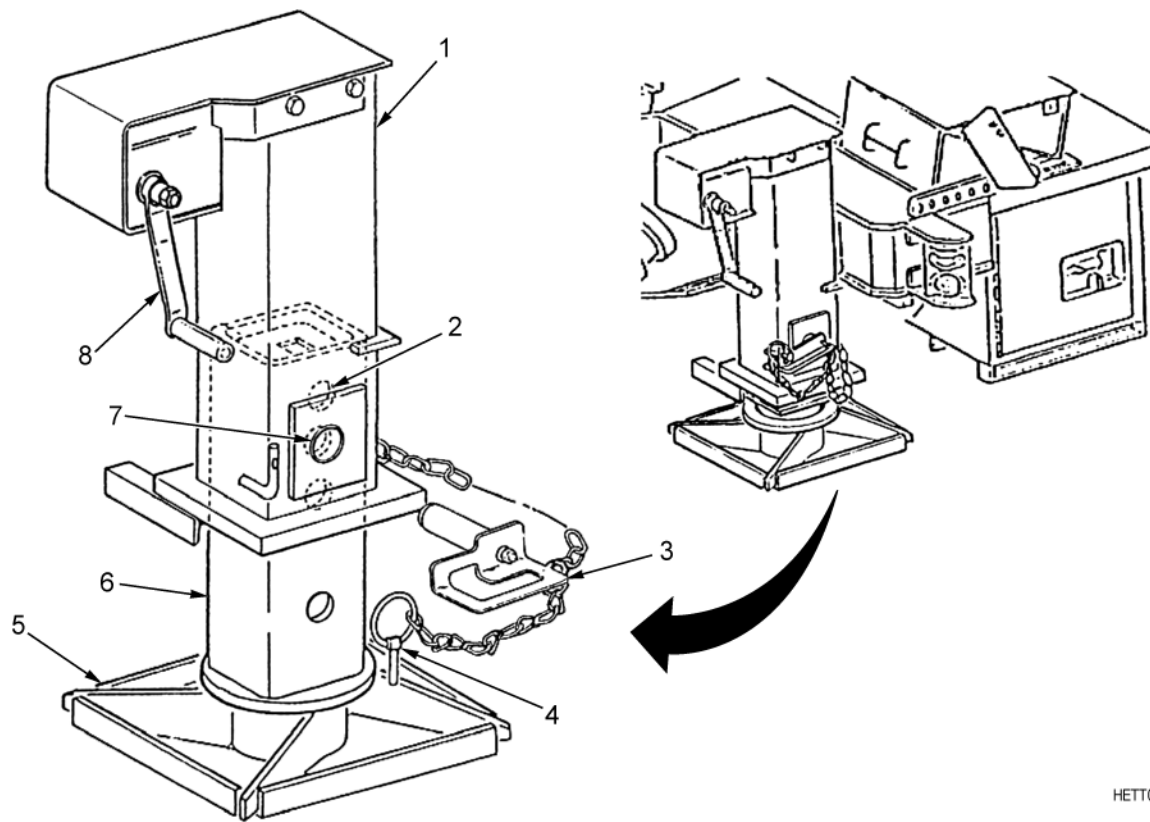
- Before performing any maintenance on the platform, lower the front and rear support legs.
- When lowering the support legs, ensure that feet and hands are clear of the support leg foot as it nears the ground.
- When lowering or raising the support legs, always install the retaining pins.

Failure to follow these warnings may result in serious injury to personnel.

NOTE

- Both front support legs are lowered the same way.
- Both support legs are identical except that the retaining pins for the curbside leg are installed from the curbside.
- Ensure the ground surface texture is strong/hard enough to support the front support legs without sinking into the ground when preparing to lower the front support legs.
- Place large pieces of lumber and/or steel plate under the support legs if extra support is required.
- Ensure semitrailer is on level ground, wheels are chocked, and trailer parking brakes are applied. If semitrailer is coupled to a tractor, apply semitrailer parking brake.

1. Start and run Auxiliary Power Unit (APU) (WP 0005).
2. Pull out suspension SHUTOFF valve to ADJUST position, ensuring valve handle is pulled outward as far as possible (WP 0004).
3. Raise platform until top edge of platform is 43 in. (109 cm) or higher (WP 0008).
4. Open and remove linch pins (Figure 1, Item 4) from retaining pins (Figure 1, Item 3).
5. Rotate handcrank (Figure 1, Item 8) clockwise to raise lower support leg (Figure 1, Item 6) sufficiently to relieve tension and permit removal of retaining pins (Figure 1, Item 3).
6. Rotate and remove retaining pins (Figure 1, Item 3) and rotate handcrank (Figure 1, Item 8) counterclockwise to lower support leg (Figure 1, Item 6) and foot (Figure 1, Item 5) toward the ground.
7. Stop handcrank (Figure 1, Item 8) rotation when highest (4th) hole (Figure 1, Item 2) in inner support leg (Figure 1, Item 6) aligns with hole (Figure 1, Item 7) in outer leg housing (Figure 1, Item 1).
8. Install and rotate retaining pin (Figure 1, Item 3) to lock retaining pin in place. Install linch pin (Figure 1, Item 4) in retaining pin.
9. Repeat steps 4 through 8 of this procedure to lower other front support leg (Figure 1, Item 6).
10. Lower platform firmly onto front support legs to support platform (WP 0008).
11. If no other adjustments are required, push in suspension SHUTOFF valve handle as far as possible to SHUTOFF position (WP 0004).
12. Shut down APU (WP 0005).



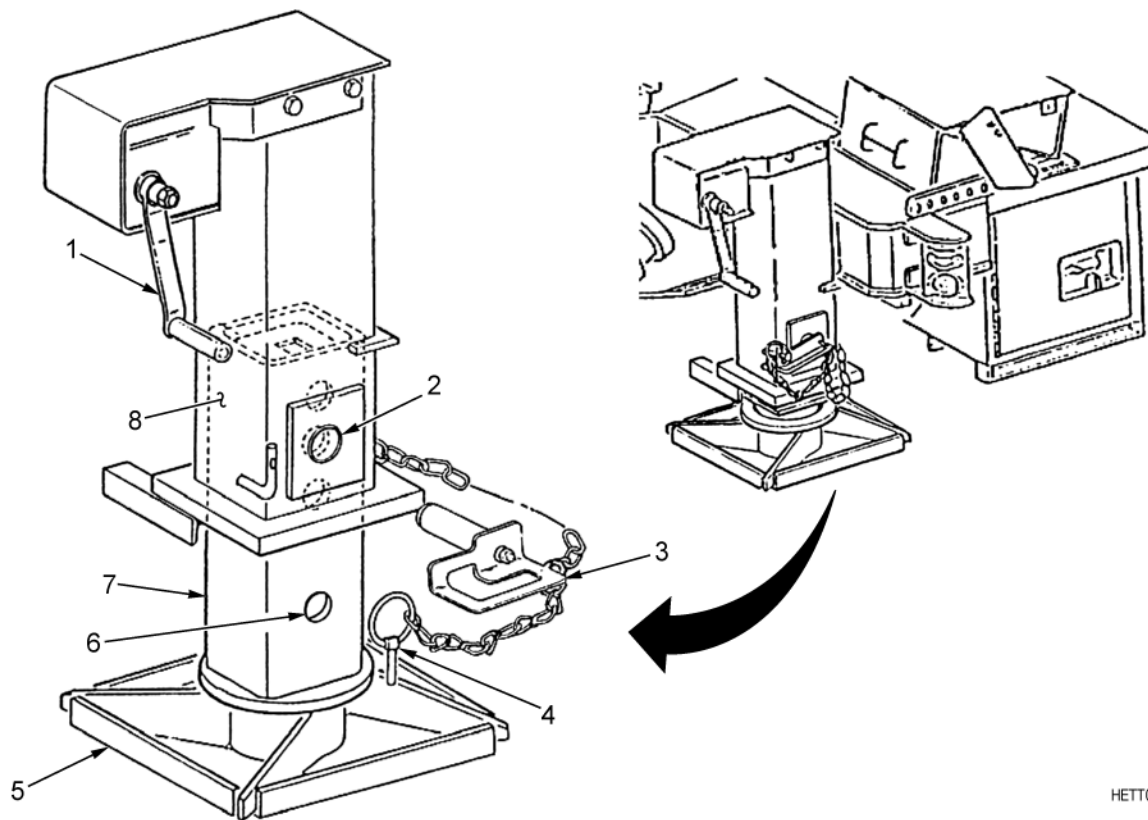
HETT0073

Figure 1. Lower Front Support Legs.

END OF TASK

Raise Front Support Leg

1. Start and run Auxiliary Power Unit (APU) (WP 0005).
2. Pull out suspension SHUTOFF valve to ADJUST position, ensuring valve handle is pulled outward as far as possible (WP 0004).
3. Raise platform until bottom edge of platform is 43 in. (109 cm) or higher (WP 0008).
4. Rotate handcrank (Figure 2, Item 1) clockwise to raise support leg foot (Figure 2, Item 5) sufficiently to permit removal of linch pins (Figure 2, Item 4) and retaining pins (Figure 2, Item 3) from support leg (Figure 2, Item 7).
5. Rotate and remove retaining pin (Figure 2, Item 3) from support leg (Figure 2, Item 7), and rotate handcrank (Figure 2, Item 1) clockwise to raise support leg and foot (Figure 2, Item 5).
6. Once support leg foot (Figure 2, Item 5) is near stow position, with lowest hole (Figure 2, Item 6) in inner leg (Figure 2, Item 7) near retaining pin hole (Figure 2, Item 2) in outer leg housing (Figure 2, Item 8), align holes (Figure 2, Item 2 and Item 6) and install retaining pins (Figure 2, Item 3) in holes.
7. Rotate retaining pin (Figure 2, Item 3) to lock retaining pin in place and install linch pin (Figure 2, Item 4) in retaining pin.
8. Repeat steps 4 through 7 of this procedure to raise other front support leg (Figure 2, Item 7).
9. Lower platform to travel height of approximately 43 in. (109 cm) (WP 0008).
10. If no other adjustments are required, push in suspension SHUTOFF valve handle as far as possible to SHUTOFF position (WP 0004).
11. Shut down APU (WP 0005).
12. If any material was used to provide ground support for front support legs, remove and stow or dispose of material. Stow wheel chocks.
13. Restow wheel chocks on gooseneck unless needed for additional tasks.



HETT0725

Figure 2. Raise Front Support Legs.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**OPERATION UNDER USUAL CONDITIONS - OPERATING REAR SUPPORT LEGS**

INITIAL SETUP:**References**

WP 0004
WP 0008

Personnel Required

1

GENERAL INFORMATION

This work package contains instructions for operating the rear support legs of the Heavy Equipment Transporter (HET) semitrailer.

OPERATING REAR SUPPORT LEGS

Lowering Rear Support Legs

WARNING



- Before performing any maintenance on the platform, lower the front and rear support legs.
- When lowering the support legs, ensure that feet and hands are clear of the support leg foot as it nears the ground.

Failure to follow this warning may result in serious injury to personnel.

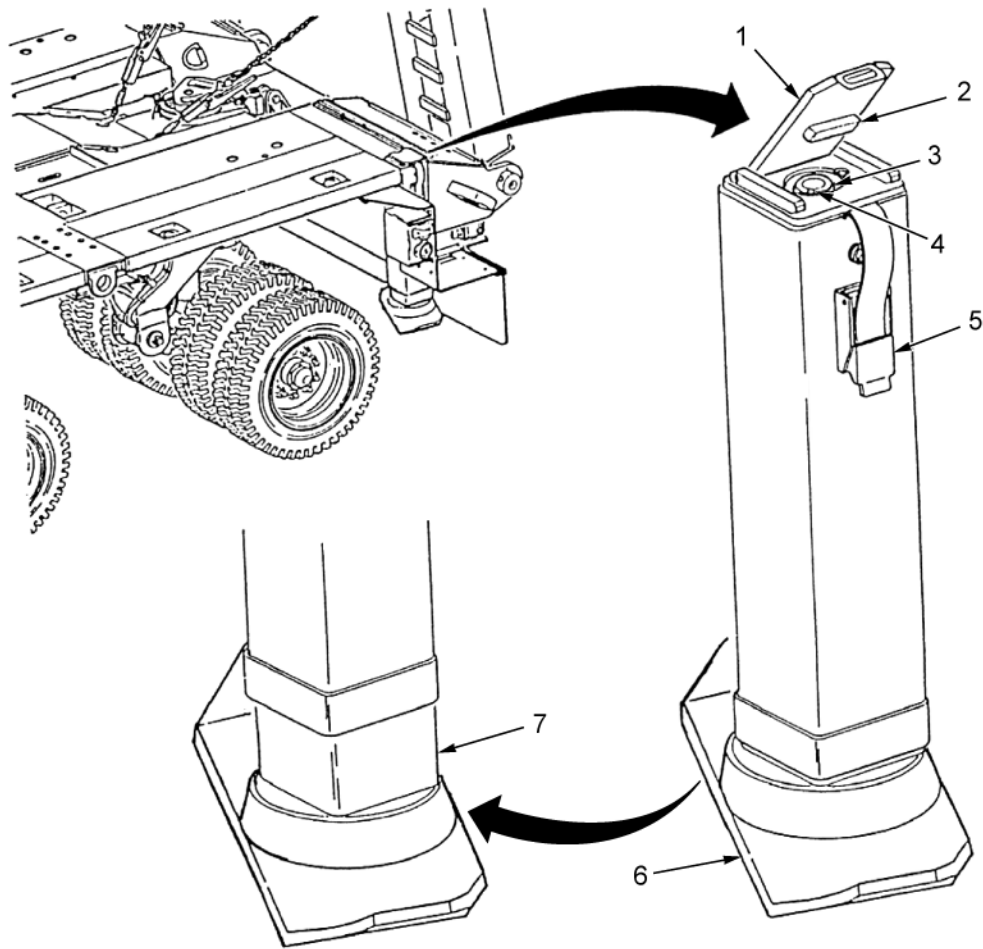
NOTE

- When preparing to lower the rear support legs, ensure the ground surface texture is strong/hard enough to support the rear support legs without sinking into the ground.
 - If extra support is required, place large pieces of lumber and/or steel plate under the support legs.
 - Ensure semitrailer is on level ground, wheels are chocked, and trailer parking brakes are applied.
 - Both rear support legs are lowered the same way.
1. Check bed height indicators for proper platform height. Proper height should be approximately 43 in. (109 cm) (WP 0004).
 2. Perform adjustments as required to achieve correct height (WP 0008).
 3. Release latch (Figure 1, Item 5) from protective cover (Figure 1, Item 1) and raise protective cover to gain access to adjusting nut (Figure 1, Item 3).
 4. If necessary, use 3/4 in. ratchet and 1 5/8 in. socket to turn adjusting nut (Figure 1, Item 3) counterclockwise until rear support leg (Figure 1, Item 7) starts to lower.
 5. Remove ratchet from socket and install 1/2 in. speed wrench to socket using 1/2 to 3/4 in. adapter. Turn speed wrench counterclockwise until support leg foot (Figure 1, Item 6) makes contact with ground.

CAUTION

Ensure that socket head screw is positioned outboard and cover closes freely, or damage to equipment may result.

6. Position adjusting nut (Figure 1, Item 3) so socket head screw (Figure 1, Item 4) is outboard and does not interfere with bar (Figure 1, Item 2) on cover (Figure 1, Item 1).
7. Remove speed wrench, adapter, and socket. Replace cover (Figure 1, Item 1) over adjusting nut (Figure 1, Item 3). Secure cover with latch (Figure 1, Item 5).
8. Repeat steps 1 through 7 of this procedure as required to lower other rear support leg.



HETT0074

Figure 1. Lower Rear Support Leg.

END OF TASK

Raising Rear Support Legs

1. Release latch (Figure 2, Item 5) and raise protective cover (Figure 2, Item 1) to gain access to adjusting nut (Figure 2, Item 3).
2. Use speed wrench, adapter, and 1 5/8 in. socket to turn adjusting nut (Figure 2, Item 3) clockwise to raise support leg (Figure 2, Item 8).

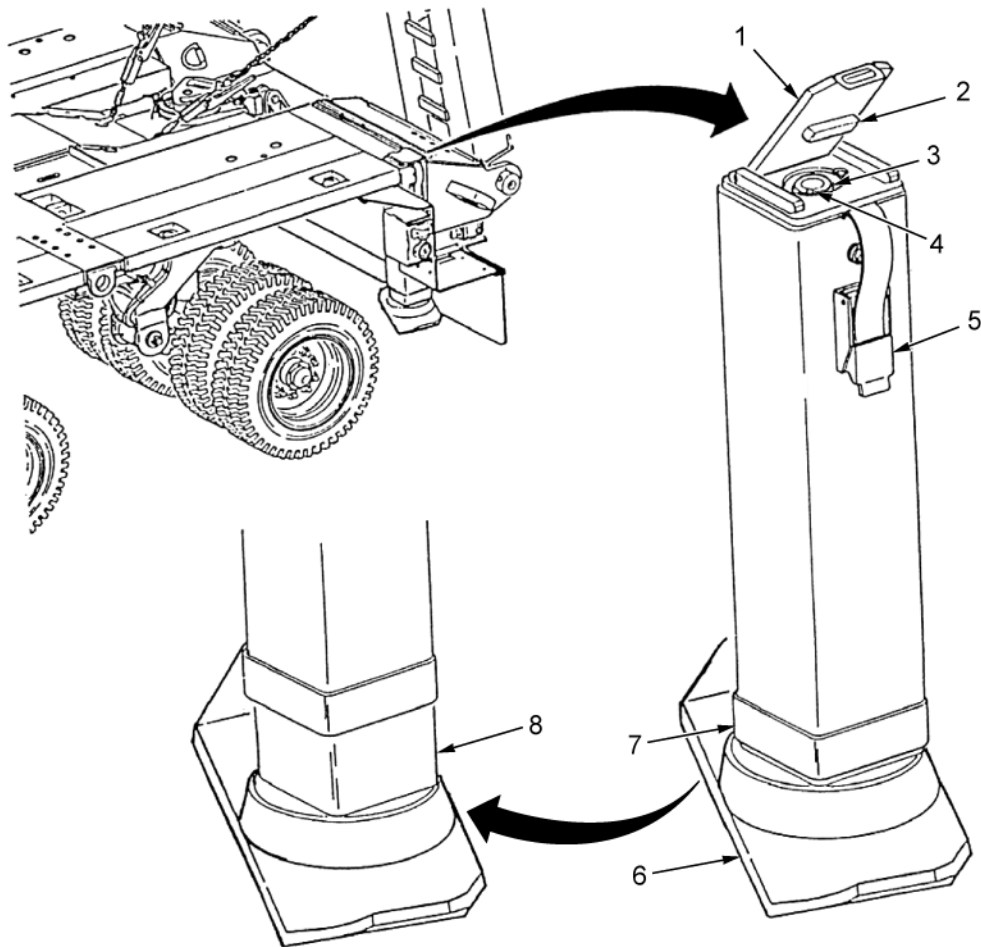
CAUTION

Ensure that socket head screw is positioned outboard and cover closes freely, or damage to equipment may result.

3. Raise support leg (Figure 2, Item 8) until foot (Figure 2, Item 6) contacts bottom of tube weldment (Figure 2, Item 7). If necessary, turn adjusting nut (Figure 2, Item 3) counterclockwise to position socket head screw (Figure 2, Item 4) outboard.
4. Remove tools, replace cover (Figure 2, Item 1) over adjusting nut (Figure 2, Item 3), and secure cover with latch (Figure 2, Item 5). Ensure that cover closes freely with no interference between bar (Figure 2, Item 2) on cover and socket head screw (Figure 2, Item 4).

NOTE

- Once support legs are supporting platform, or retracted and stowed for transport, stow tools back in platform storage compartment.
 - If any material was used to provide ground support for rear support legs, remove and stow or dispose of material.
5. Repeat steps 1 through 4 of this procedure, as required, to raise other rear support leg (Figure 2, Item 8).



HETT0726

Figure 2. Raise Rear Support Leg.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**OPERATION UNDER USUAL CONDITIONS - TRACTOR/SEMITRAILER COUPLING AND UNCOUPLING**

INITIAL SETUP:**Materials/Parts**

Grease, Automotive and Artillery (WP 0170, Item 16)

WP 0008

WP 0010

WP 0011

Personnel Required

2

WP 0012

WP 0035

References

WP 0005

WP 0170

WP 0007

TM 9-2320-360-10

GENERAL INFORMATION

This work package contains instructions for coupling and uncoupling the Heavy Equipment Transporter (HET) tractor/semitrailer.

TRACTOR/SEMITRAILER COUPLING AND UNCOUPLING

Tractor/Semitrailer Coupling

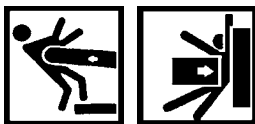
1. Apply generous amount of grease (WP 0170) to contact areas of pickup plate (Figure 1, Item 1), kingpin (Figure 1, Item 2), steering wedge (Figure 1, Item 3), vee entry ramps (Figure 1, Item 4), and fifth-wheel (Figure 1, Item 9).

CAUTION

The tractor fifth-wheel side-to-side oscillation lockouts must be disengaged for all tractor/semitrailer operations or severe damage to equipment may result.

2. Ensure both fifth-wheel locks (Figure 1, Item 10) are set to accept kingpin (Figure 1, Item 2). If tractor fifth-wheel (Figure 1, Item 9) is equipped with side-to-side oscillation lockouts (Figure 1, Item 8) (TM 9-2320-360-10), ensure lockouts are disengaged.
3. Start and run Auxiliary Power Unit (APU) (WP 0005).
4. Ensure front and rear support legs are lowered and supporting platform (WP 0011 and WP 0012).

WARNING



Prior to adjusting the gooseneck's height, pull out both the gooseneck isolation valve and the suspension SHUTOFF valve handles to the ADJUST position to prevent unexpected movement. Failure to follow this warning may result in injury to personnel and damage to equipment.

5. Ensure gooseneck isolation valve handle (Figure 1, Item 7) and suspension SHUTOFF valve handle (Figure 1, Item 6) are pulled outward to ADJUST positions. Ensure both valve handles are pulled out as far as they will go.

NOTE

The gooseneck kingpin should be approximately the same height as the tractor fifth-wheel.

6. If required, adjust gooseneck height (WP 0007) using gooseneck valve (Figure 1, Item 5) so that kingpin (Figure 1, Item 2) and tractor fifth-wheel (Figure 1, Item 9) are approximately same height.

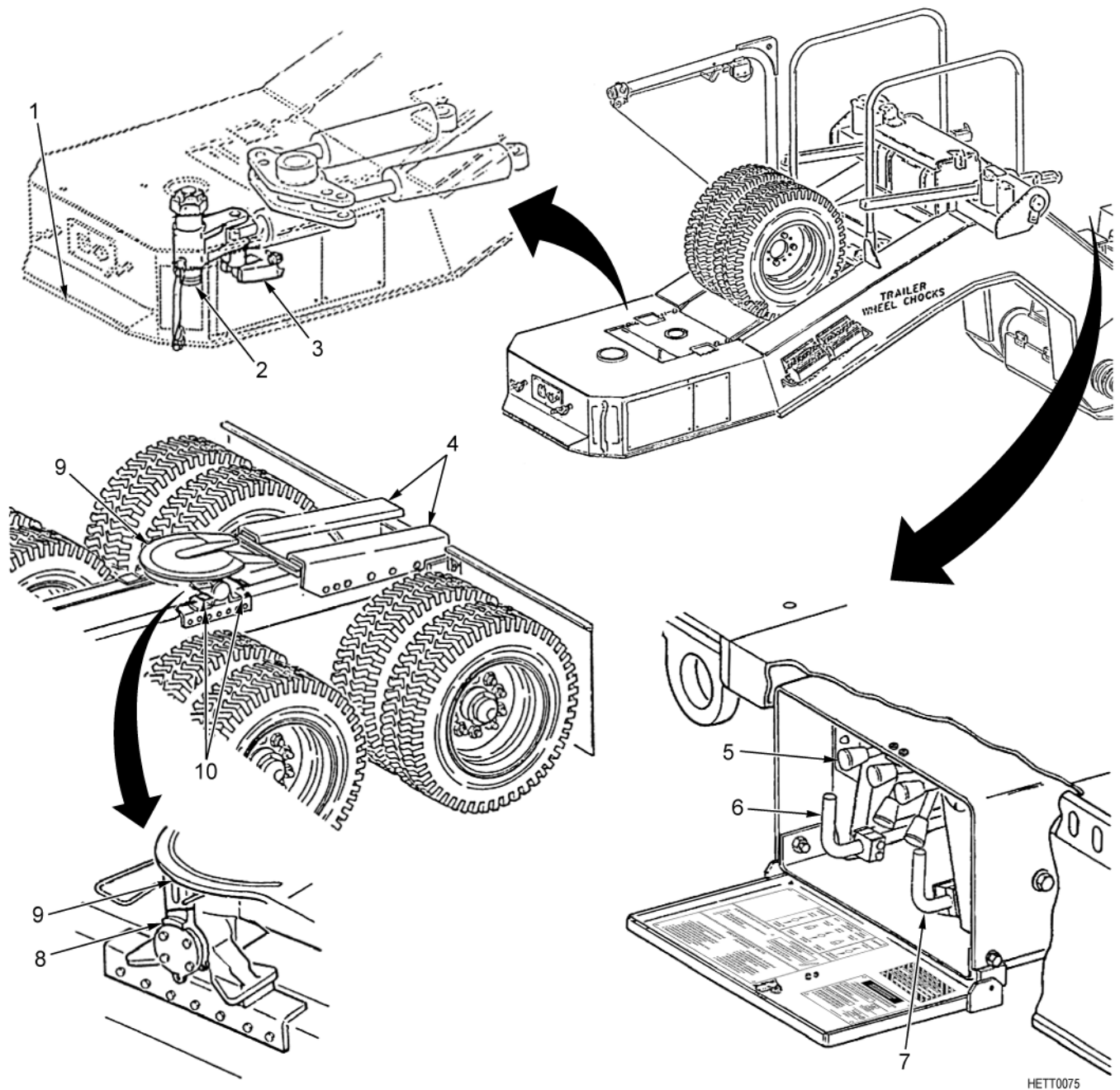


Figure 1. Coupling Tractor/Semitrailer.

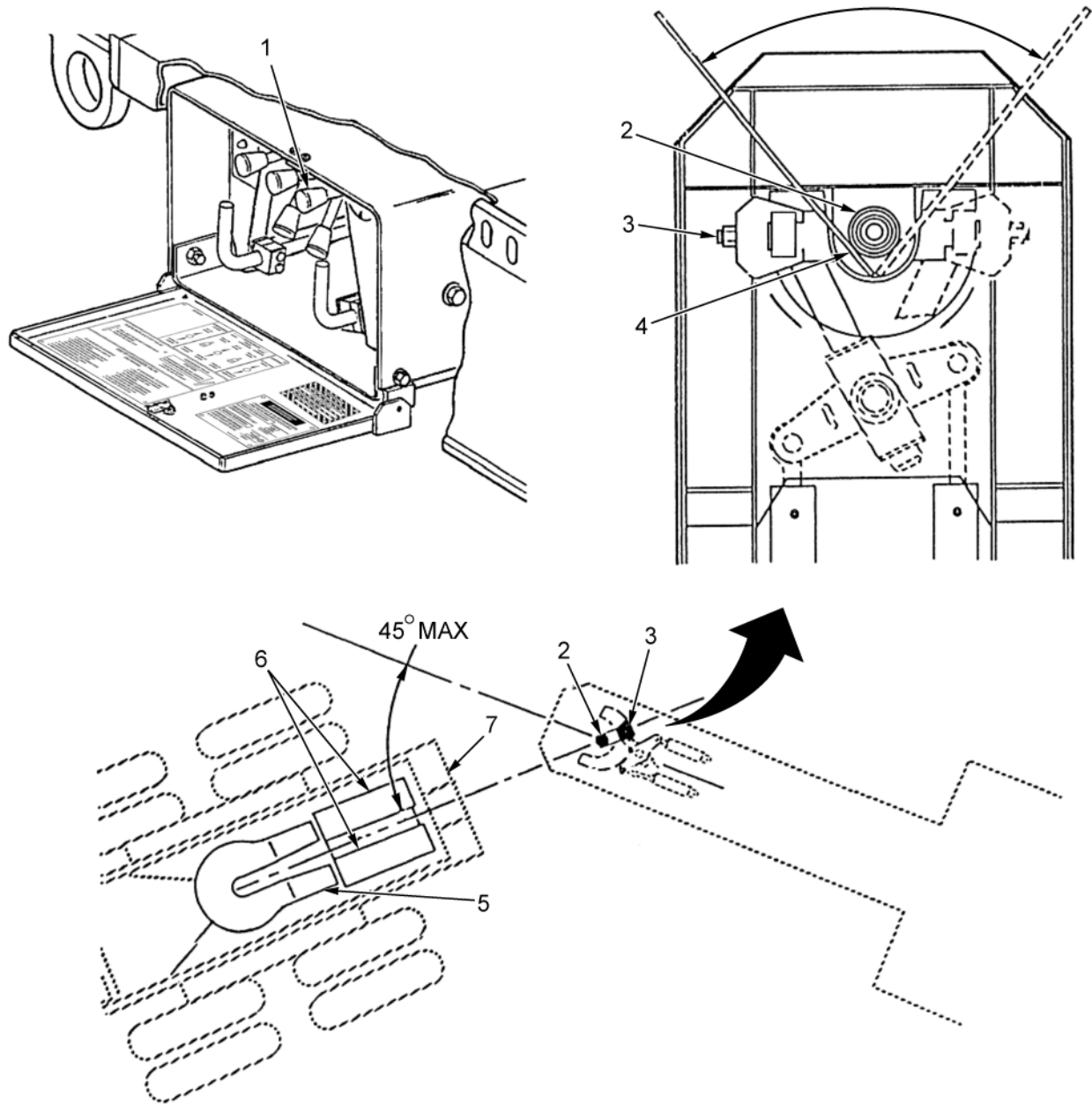
NOTE

- The optimal condition when coupling the tractor/semitrailer is with both vehicles in a straight line.
 - Coupling can be accomplished with the tractor and semitrailer at an offset angle (not greater than 45 degrees).
 - To prevent the tires from moving while adjusting the steering wedge, DO NOT release the brakes on the semitrailer.
 - Perform steps 7 through 12 to adjust the steering wedge.
7. Using steering valve (Figure 2, Item 1), manually adjust steering wedge (Figure 2, Item 3) to align with tractor fifth-wheel vee entry (Figure 2, Item 6).

NOTE

When the steering wedge is significantly offset from the previous uncoupling (more than 45 degrees), or the semitrailer is being operated improperly, movement of the steering wedge may not respond to the operation of the steering valve. If this condition exists, continue with steps 8 and 9 as required.

8. If steering wedge (Figure 2, Item 3) does not respond to operation of steering valve (Figure 2, Item 1), attempt to induce movement using crowbar (Figure 2, Item 4) and spotter to push/pull against steering wedge (Figure 2, Item 3) while operating steering valve (Figure 2, Item 1).
9. If steering wedge (Figure 2, Item 3) cannot be moved by crowbar (Figure 2, Item 4) and steering valve (Figure 2, Item 1), it may be necessary to apply greater force by gently bumping steering wedge with tractor fifth-wheel (Figure 2, Item 5).
10. While continuing to operate steering valve (Figure 2, Item 1), direct tractor operator to slowly back tractor (Figure 2, Item 7) toward kingpin (Figure 2, Item 2) until one side of fifth-wheel vee entry (Figure 2, Item 6) contacts steering wedge (Figure 2, Item 3) and pushes it toward center.
11. Once steering wedge (Figure 2, Item 3) has started to move, stop tractor (Figure 2, Item 7) and apply tractor brakes (TM 9-2320-360-10).
12. Use steering valve (Figure 2, Item 1) to manually align steering wedge (Figure 2, Item 3) with kingpin (Figure 2, Item 2) for entry in tractor fifth-wheel (Figure 2, Item 5).

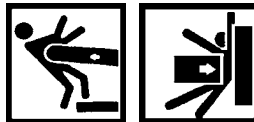


HETT0076

Figure 2. Coupling Tractor/Semitrailer.

NOTE

- The adjusting nut needs to be backed off a minimum of only one full turn when connecting the semitrailer from one tractor to another of the same type (example: M911 to M911).
 - The adjusting nut needs to be backed off a minimum of three full turns when connecting the semitrailer from one type of tractor to another (example: M911 to M1070).
13. Use 3/4 in. (0.75 cm) ratchet, 3/4 in. (0.75 cm) extension, and 1 7/8 in. (2.76 cm) socket to turn adjusting nut (Figure 3, Item 9) appropriate number of full turns counterclockwise. This will ensure steering wedge (Figure 3, Item 8) is properly fitted and can be tightened after kingpin (Figure 3, Item 7) is locked in tractor fifth-wheel (Figure 3, Item 3).

WARNING

Two personnel are required for coupling the tractor/semitrailer during hookup. The operator of the tractor must know the position of the spotter at all times. Failure to follow this warning may result in injury to personnel.

NOTE

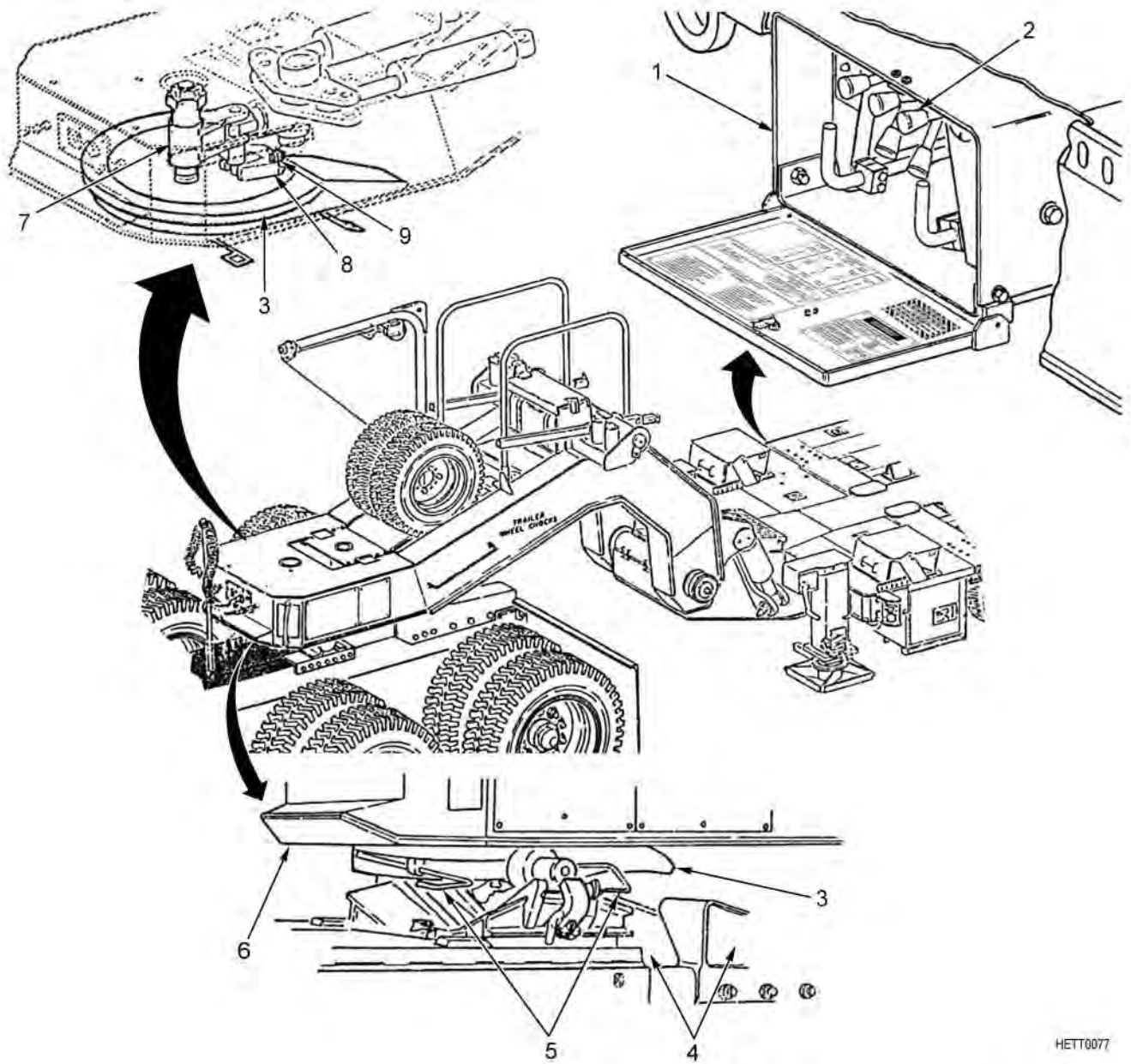
With the aid of an assistant positioned on the streetside of the semitrailer and using hand signals, align the tractor with the semitrailer.

14. Spotter must visually check tractor fifth-wheel (Figure 3, Item 3), vee entry ramps (Figure 3, Item 4), semitrailer kingpin (Figure 3, Item 7), and steering wedge (Figure 3, Item 8) for alignment.
15. Have operator continue backing tractor so that fifth-wheel (Figure 3, Item 3) is approximately 2 in. (5.0 cm) from front of gooseneck pickup plate (Figure 3, Item 6) and then stop.
16. Adjust gooseneck height so that gooseneck pickup plate (Figure 3, Item 6) is approximately 1 to 2 in. (2.5 to 5.0 cm) lower than tractor fifth-wheel (Figure 3, Item 3) (WP 0007).

CAUTION

DO NOT allow the kingpin to miss and/or overrun the fifth-wheel or severe damage to the tractor and the semitrailer may result.

17. With spotter positioned at semitrailer hydraulic control panel (Figure 3, Item 1), have spotter make final adjustments to steering wedge alignment by operating steering valve (Figure 3, Item 2).
18. Have tractor operator back up until kingpin (Figure 3, Item 7) is firmly in place in fifth-wheel (Figure 3, Item 3). Have spotter confirm that semitrailer kingpin is seated and both fifth-wheel locks (Figure 3, Item 5) are properly engaged.



HETT0077

Figure 3. Coupling Tractor/Semitrailer.

CAUTION

If the tractor has been coupled to an offset angle, manually steer the wheels to the appropriate direction or damage to the equipment may result.

NOTE

- Ensure the kingpin is locked into the tractor fifth-wheel.
- Ensure the wheel chocks for the tractor and semitrailer are in place and properly secured.

19. Set parking brake on tractor (TM 9-2320-360-10).
20. Disconnect both air lines from tractor dummy coupling. Remove dummy coupling from semitrailer air connectors (TM 9-2320-360-10).
21. Apply a small amount of grease (WP 0170) on all rubber grommets.
22. Connect air brake system from tractor to semitrailer by mating service (blue) air connectors (Figure 4, Item 4) and emergency (red) air connectors (Figure 4, Item 2).
23. Disconnect electrical connector from tractor's electrical dummy coupling (TM 9-2320-360-10).
24. Raise cover of 12-pin electrical connector (Figure 4, Item 3) and connect tractor electrical cable (Figure 4, Item 5) to electrical connector.
25. Have spotter check steering wedge (Figure 4, Item 6) alignment in tractor fifth-wheel (Figure 4, Item 7). If necessary, signal spotter to reposition steering wedge.

WARNING



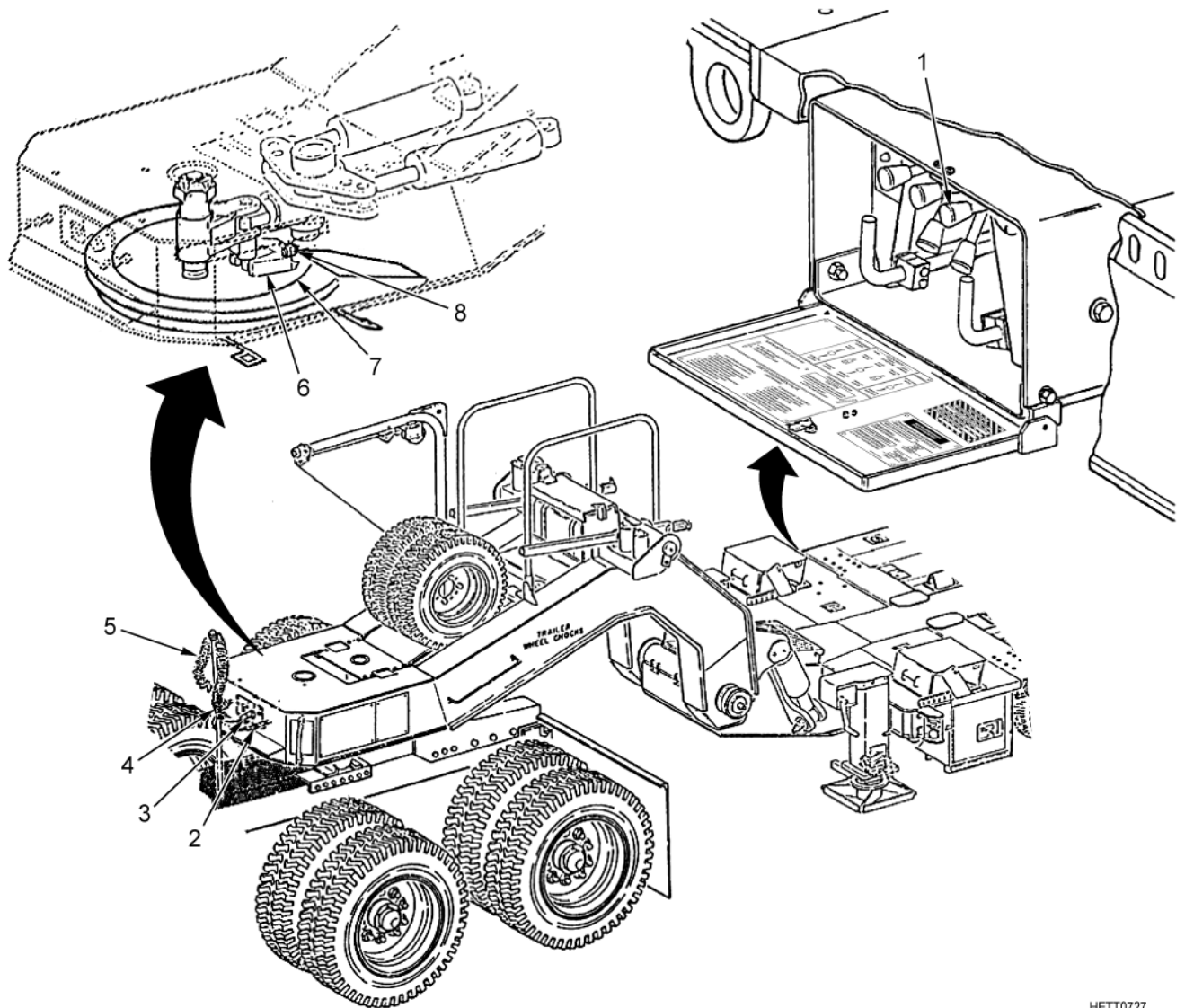
Ensure the person who is adjusting the steering wedge adjusting nut is clear when the steering wedge is cycled back and forth. Failure to follow this warning may result in injury to personnel.

26. Turn adjusting nut (Figure 4, Item 8) clockwise until steering wedge (Figure 4, Item 6) tightens securely into fifth-wheel (Figure 4, Item 7). Have spotter continually operate steering valve (Figure 4, Item 1) slightly left and right and tighten adjusting nut to remove all play.

NOTE

- Push in the trailer's air supply control in the tractor to provide air to the semitrailer's air brake system.
- Allow ample time for the air tanks to charge and then apply the brakes to ensure the brakes are working properly.

27. Apply tractor parking brakes (TM 9-2320-360-10).
28. Raise front and rear support legs (WP 0011 and WP 0012).
29. Remove and stow tractor and semitrailer wheel chocks (TM 9-2320-360-10).



HETT0727

Figure 4. Coupling Tractor/Semitrailer.

NOTE

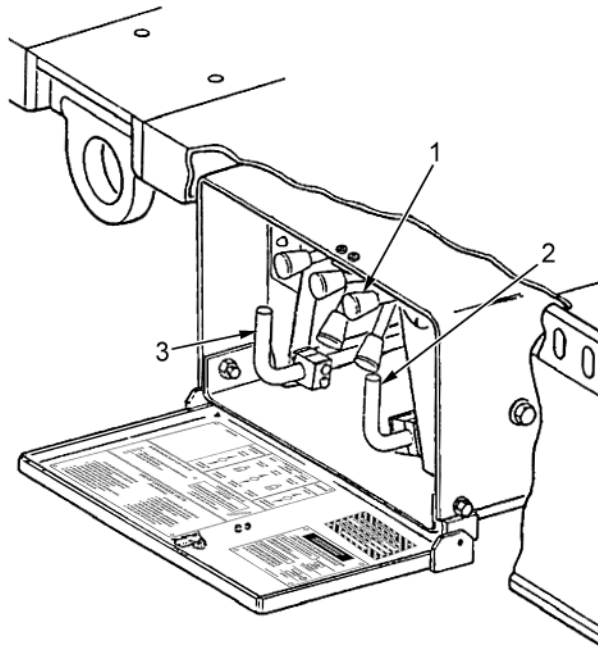
If the gooseneck isolation valve is hard to move, equalize the gooseneck's hydraulic pressure by raising the gooseneck isolation valve handle until the system's pressure reads 1,500 psi (10,343 kPa), and then lowering gooseneck isolation valve handle until the system's pressure readings equal the two front suspension gauge pressure readings.

30. Push in gooseneck isolation valve handle (Figure 5, Item 2) to RUN position. Ensure handle is pushed inward as far as possible.
31. If necessary, perform minor deck height adjustments in front and then rear (WP 0008), which may be required due to platform suspension relaxing when gooseneck isolation valve handle (Figure 5, Item 2) is pushed inward to RUN position.
32. Push in suspension SHUTOFF valve handle (Figure 5, Item 3) to SHUTOFF position. Ensure handle is pushed inward as far as possible.

NOTE

- Have the tractor operator attempt to pull forward with semitrailer brakes set to ensure the steering wedge is set in the tractor fifth-wheel and the adjusting nut is secure.
 - Drive the tractor/semitrailer ahead in a straight line approximately 60 ft (18 m) to check the semitrailer's tracking.
 - Perform step 33, if required, until semitrailer properly tracks the tractor.
33. If semitrailer does not properly track, use manual steering valve (Figure 5, Item 1) to realign steering (WP 0010).

34. Shut down APU (WP 0005).



HETT0078

Figure 5. Coupling Tractor/Semitrailer.

END OF TASK

Tractor/Semitrailer Uncoupling

WARNING



- **DO NOT** uncouple tractor/semitrailer if the tractor has less than normal operating air pressure, approximately 100 to 120 psi (689 to 827 kPa), or the semitrailer will not have sufficient air pressure to apply or release the brakes.
- **DO NOT** uncouple a loaded semitrailer from the tractor for purposes of performing maintenance tasks on the semitrailer.

Failure to follow these warnings may result in injury to personnel and damage to equipment.

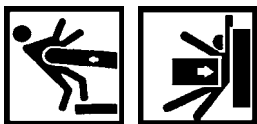
CAUTION

Ensure the trailer handbrake control (Johnny Bar) in the tractor cab is completely released prior to applying the tractor parking brakes or loss of the semitrailer's reserve air supply may occur.

NOTE

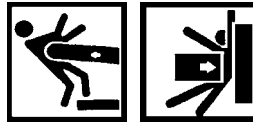
- Using one spotter, maneuver tractor/semitrailer in an area for semitrailer parking. Once positioned for parking, apply tractor parking brakes.
 - Remove four wheel chocks from gooseneck.
1. Position wheel chocks (Figure 6, Item 2) in front and behind each outer set of dual tires (Figure 6, Item 1) for right and left front bogies (Figure 6, Item 8).
 2. Disconnect 12-pin electrical connector (Figure 6, Item 7). Connect electrical connector to dummy connector on tractor. Ensure electrical connector cover on semitrailer is closed.
 3. Disconnect emergency (red) air connector (Figure 6, Item 6) and service (blue) air connector (Figure 6, Item 4) from semitrailer. Connect both air connectors on dummy connectors on tractor.

WARNING



Ensure that vented dummy coupling is installed on the emergency (red) gladhand prior to releasing brakes with the brake release valve. If a nonvented dummy coupling is installed, the parking brakes cannot be reapplied. Failure to follow this warning may result in injury to personnel.

4. Install dummy connectors (Figure 6, Item 5) to semitrailer emergency and service air connectors (Figure 6, Item 6 and Item 4).
5. Start and run APU (WP 0005).
6. Pull out handle of suspension SHUTOFF valve (Figure 6, Item 3) as far as possible to ADJUST position.

WARNING

The front support legs must be lowered to support the platform before operating the gooseneck isolation valve. Failure to follow this warning may result in injury to personnel from unwanted gooseneck/suspension movement and damage to equipment.

7. Lower both front and rear support legs (WP 0011 and WP 0012) to support platform.

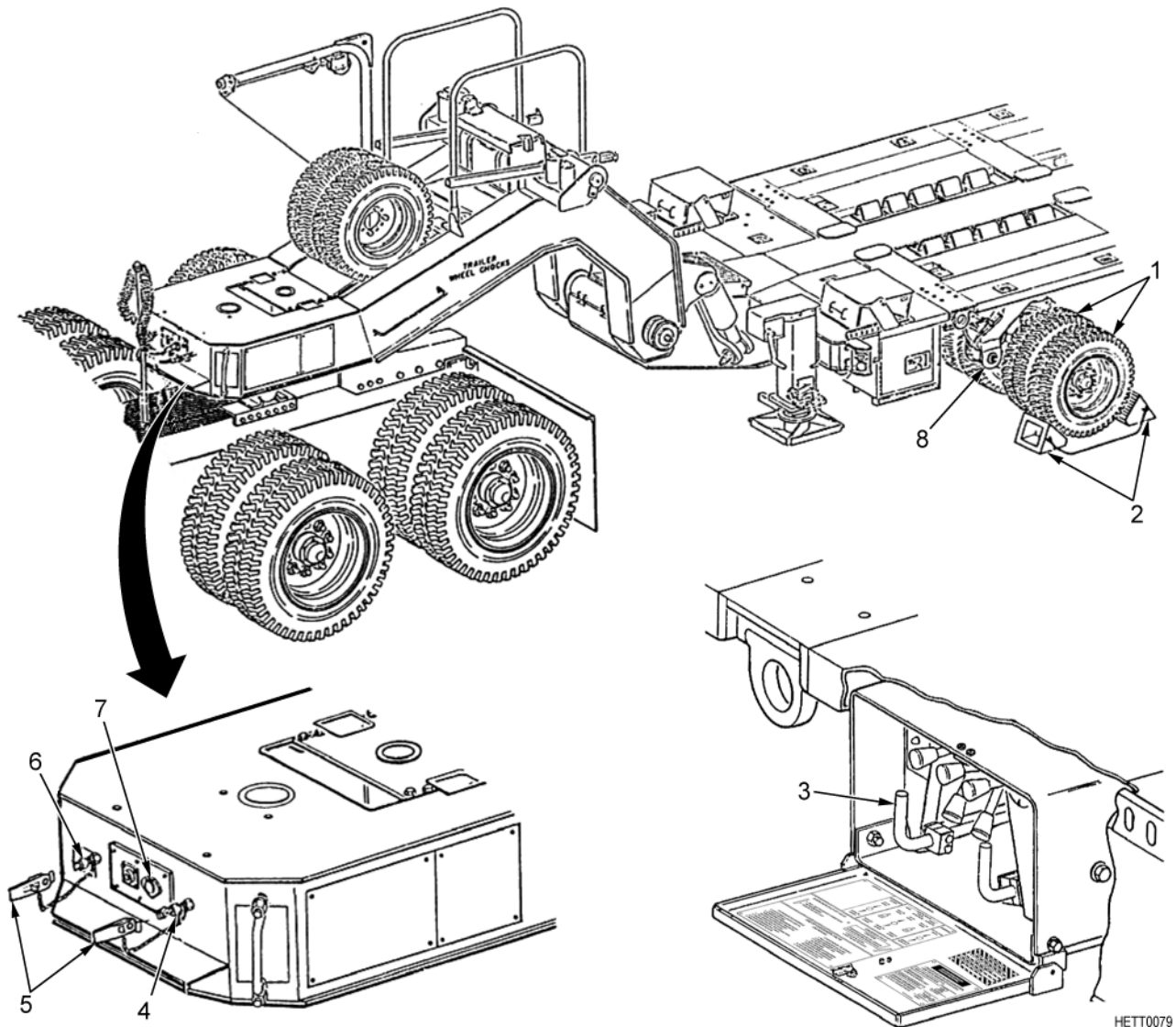


Figure 6. Uncoupling Tractor/Semitrailer.

WARNING

Prior to moving the tractor from under the gooseneck, place the gooseneck isolation valve handle in the ADJUST position, handle pulled outward. Failure to follow this warning may result in injury to personnel and damage to equipment from unwanted gooseneck/suspension movement.

8. Pull out handle of gooseneck isolation valve (Figure 7, Item 4) as far as possible to ADJUST position.
9. Loosen steering wedge adjusting nut (Figure 7, Item 2) one full turn until lockwasher (Figure 7, Item 10) behind nut is no longer compressed.

NOTE

If tractor fifth-wheel lock handles cannot be moved to the release position, set semitrailer parking brakes and move the tractor rearward against the semitrailer to release pressure on fifth-wheel locking mechanism.

10. If necessary, have tractor operator back tractor against semitrailer and have a spotter unlock both tractor fifth-wheel locks (Figure 7, Item 9).

WARNING

All spotters and ground personnel around the tractor/semitrailer must stand clear of the vehicles during uncoupling. Failure to follow this warning may result in injury to personnel from unwanted gooseneck/suspension movement and damage to equipment.

11. Signal operator to release tractor parking brakes and slowly drive forward approximately 1 ft (0.3 m) until kingpin (Figure 7, Item 1) is in vee entry (Figure 7, Item 6) of tractor's fifth-wheel (Figure 7, Item 8).
12. Raise gooseneck (WP 0007) until it is approximately 3 in. (7.6 cm) above fifth-wheel (Figure 7, Item 8).
13. Have operator drive tractor (Figure 7, Item 7) out from under semitrailer gooseneck (Figure 7, Item 5).
14. Lower gooseneck (Figure 7, Item 5) to lowest position (WP 0007).
15. Push in gooseneck isolation valve handle (Figure 7, Item 4) to RUN position. Ensure isolation valve handle is pushed in as far as possible.
16. Push in suspension SHUTOFF valve handle (Figure 7, Item 3) to SHUTOFF position. Ensure suspension SHUTOFF valve handle is pushed in as far as possible.
17. Shut down APU (WP 0005).

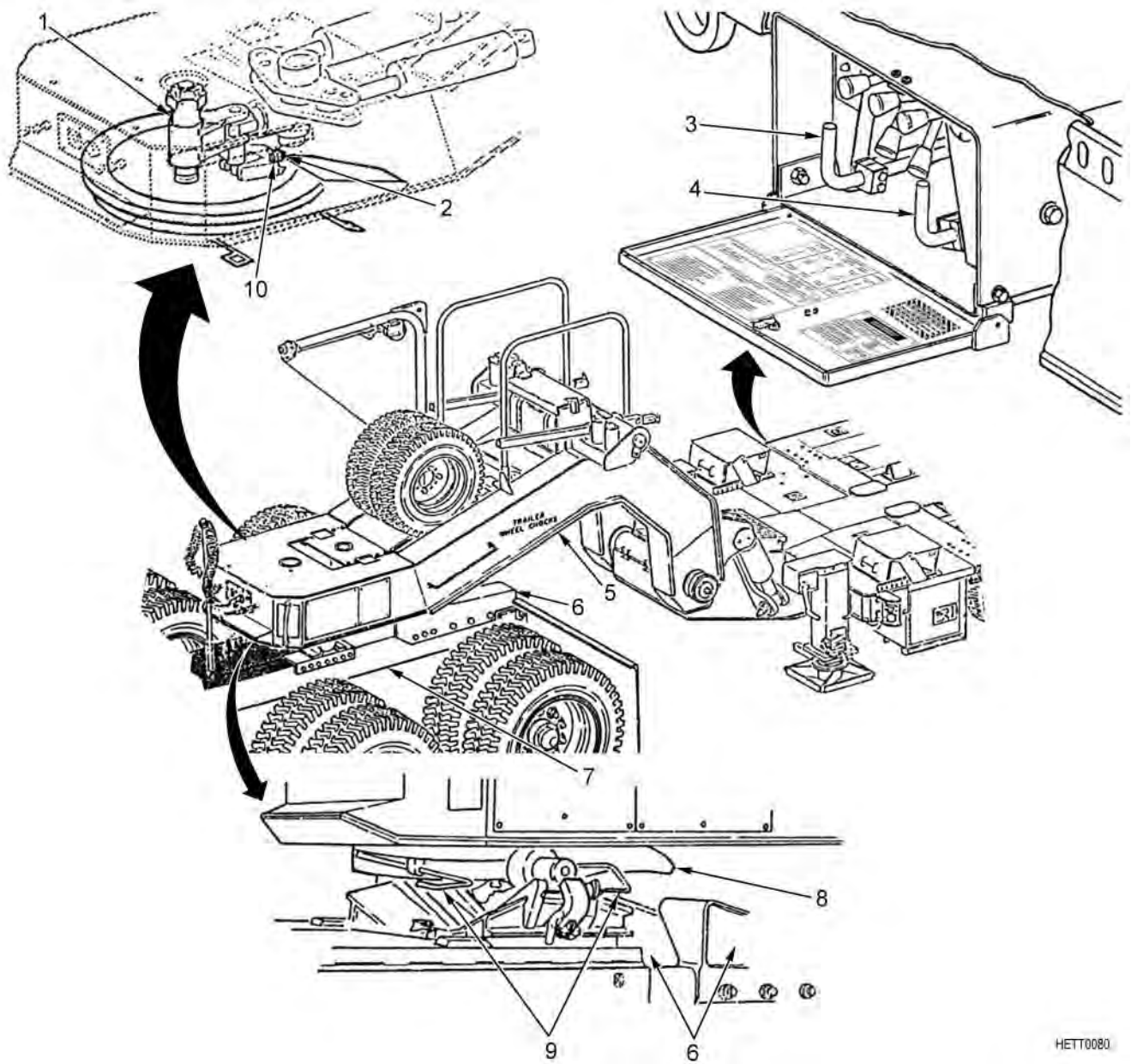


Figure 7. Uncoupling Tractor/Semitrailer.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**OPERATION UNDER USUAL CONDITIONS - HIGHWAY DRIVING**

INITIAL SETUP:**Personnel Required**

2

WP 0010

WP 0025

TM 9-2320-360-10

ReferencesWP 0005

GENERAL INFORMATION

This work package contains highway driving instructions for the Heavy Equipment Transporter (HET) semitrailer.

HIGHWAY DRIVING**Driving****WARNING**

- Precautions must be exercised during highway travel to ensure that all bridges and underpasses can be negotiated.
- When towing a payload, check security of load and tighten tiedowns at every rest and maintenance stop.
- Ensure position of assistant is known at all times.
- All safety requirements, such as hazard flags, road permits, flashing warning lights, escort vehicles, and wide-load signs must be met.

Failure to follow these warnings may result in injury to personnel and damage to equipment.

WARNING

Under no circumstances shall speeds exceed the following:

- Highway 45 mph (72 km/h)
- Secondary 40 mph (64 km/h)
- Off-road 15 mph (24 km/h)

Failure to follow these warnings may result in injury to personnel and damage to equipment.

1. Consider overall length of tractor and semitrailer when towing semitrailer and passing other vehicles. During trailering operations, acceleration rate is reduced and stopping distance is increased.

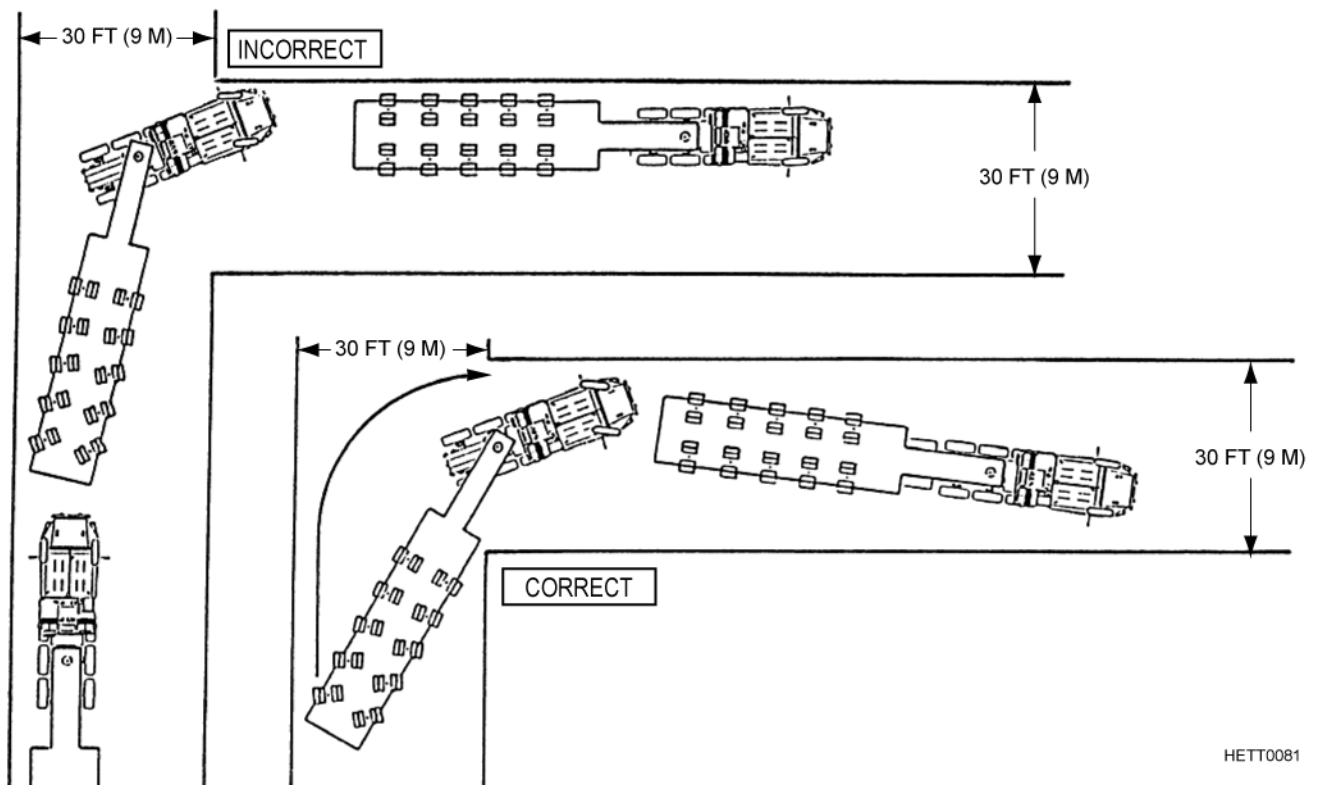
END OF TASK

Turning With M911 or M1070 Tractor**WARNING**

- The HET tractor and semitrailer combination does not track in the same way as standard or conventional tractor-trailer combinations. Operators must know and understand this point prior to operating the HET on public access roads. Wide, conventional tractor-trailer turns may result in injury to personnel and damage to equipment.
- When making sharp turns, the semitrailer may swing beyond normal turning radius.

Failure to follow these warnings may result in injury to personnel and damage to equipment.

1. Turning the tractor also causes the semitrailer wheels to turn with the M911 or M1070 tractor and M1000 semitrailer combination. Semitrailer may swing out into the lane of oncoming traffic. Operator must ensure lane is clear prior to making turn. Left and right turns should be made tighter than conventional tractor-trailer turns.



HETT0081

Figure 1. Turning.

END OF TASK

Backing With M911 or M1070 Tractor**WARNING**

- Using the M911 or M1070 tractor, the semitrailer will not back like a normal semitrailer because of the semitrailer's steering system.
- The operator must back the tractor/semitrailer by turning the tractor's steering wheel in the opposite direction than would be used for backing with a normal semitrailer.

Failure to follow these warnings may result in injury to personnel and damage to equipment.

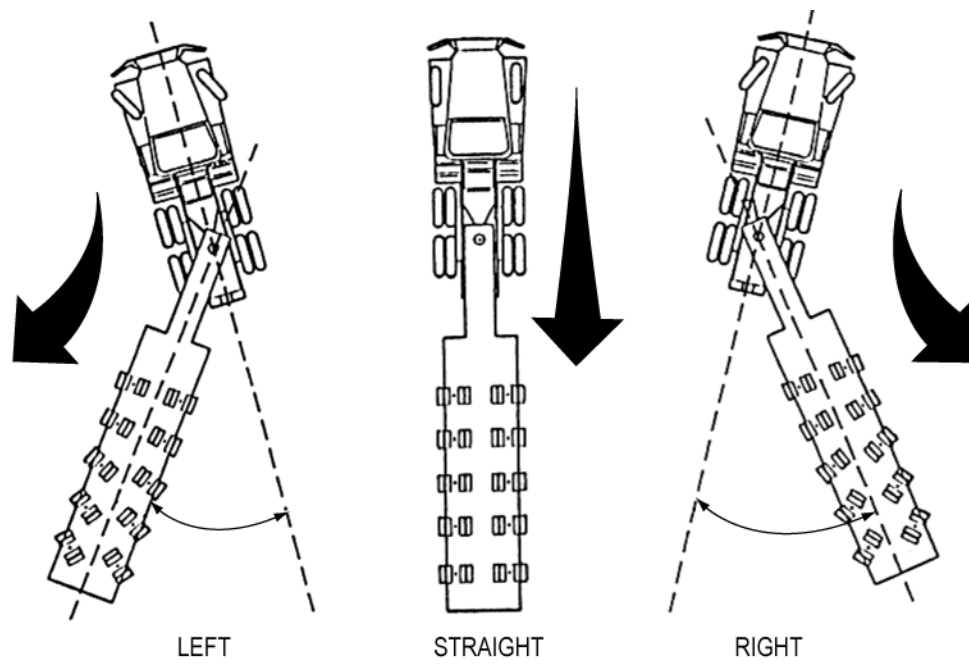
CAUTION

- When backing, excessively sharp, over steering turns will cause damage to equipment. If the angle between the tractor chassis and gooseneck exceeds 60 degrees, damage to tires may occur.
- If the angle exceeds 90 degrees, severe damage to semitrailer steering components and tractor fifth-wheel will occur.
- Extreme caution must be exercised when maneuvering the tractor/semitrailer in confined spaces (i.e., motor pools, parking lots, filling stations) where over-steer angles may easily be achieved through normal driving capability of the tractor.

Failure to follow these cautions will result in severe damage to equipment.

NOTE

- When backing, always use a spotter for guidance.
 - Always use mirrors when backing, and keep spotter in sight at all times.
 - When backing, the rear of the semitrailer will move in the same direction as the front tractor wheels.
1. If tractor wheels are turned right, semitrailer wheels will steer left and cause semitrailer to back to the right with tractor.
 2. If tractor wheels are turned left, semitrailer wheels will steer right and cause semitrailer to back to the left with tractor.



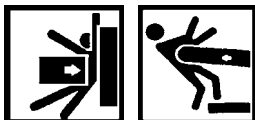
HETT0082

Figure 2. Backing.

END OF TASK

Manually Steering Semitrailer

WARNING



- The tractor operator must drive slowly and maintain constant visual contact with the spotter.
- When manually steering the semitrailer, the tractor operator should make many starts and stops to give the spotter time to adjust steering.
- The tractor operator should allow even space on both sides of the tractor so that the spotter who is steering the semitrailer has room to make adjustments.

Failure to follow these warnings may result in injury to personnel and damage to equipment.

1. Manually steer semitrailer to allow clear passage if tractor/semitrailer is in an area with limited turning ability.
2. Steer semitrailer (WP 0010) left or right to make room for tractor/semitrailer to pass through a tight area by having spotter located at semitrailer hydraulic control panel.

END OF TASK

Stopping

1. Apply brakes on tractor and semitrailer at the same time during normal operation when driver steps on tractor brake pedal.
2. Apply brake pressure gradually and smoothly.
3. Use good judgment and observe road conditions while stopping. Use caution on steep downgrades and slippery surfaces.

END OF TASK

Parking

CAUTION

Ensure that the trailer hand brake control (Johnny Bar) in the tractor cab is completely released prior to applying the tractor's parking brakes or loss of the semitrailer's reserve air supply may result.

NOTE

If a hissing sound is heard from the tractor's parking brake control valve after setting the parking brakes, the brake pedal must be released, and the trailer air supply control in the tractor must be pushed in and then pulled out.

1. Ensure trailer hand brake control (Johnny Bar) located on steering column in tractor cab is completely released when tractor/semitrailer combination is to be parked and left unattended. Set parking brakes (TM 9-2320-360-10).
2. Ensure tractor engine (TM 9-2320-360-10) and semitrailer Auxiliary Power Unit (APU) are shut down (WP 0005). If hissing sound is heard from tractor's parking brake control valve after setting parking brakes, release tractor brake pedal; push in and then pull out trailer air supply control in tractor.
3. Chock wheels on tractor and semitrailer (WP 0035).
4. Refer to Parking Loaded Semitrailer (WP 0025) for specific details on parking.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**OPERATION UNDER USUAL CONDITIONS - LOADING ABLE PAYLOADS****INITIAL SETUP:****Personnel Required**

3

WP 0008

WP 0009

WP 0012

WP 0013

WP 0035

TM 9-2320-360-10

References

WP 0002

WP 0004

WP 0005

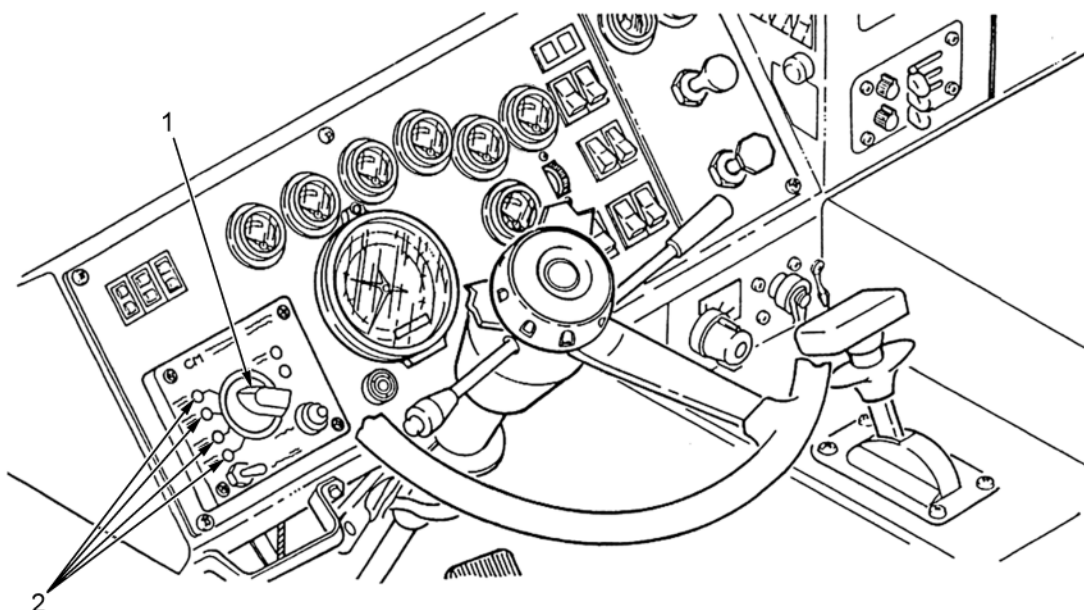
GENERAL INFORMATION

This work package contains instructions for loading able payloads onto the Heavy Equipment Transporter (HET) semitrailer.

LOADING ABLE PAYLOADS**NOTE**

- The following procedures provide instructions for loading and unloading an able payload (M1 Series Main Battle Tank) on the M1000 semitrailer coupled to a U.S. Army M1070 or M911 tractor.
- The M1070 tractor is illustrated as the prime mover throughout these instructions.
- Operations unique to the M911 tractor will be identified and/or referenced to the applicable Operating Instructions (TM 9-2320-360-10).

1. Start tractor (TM 9-2320-360-10).
2. On M1070 tractor, set central tire insulation system (CTIS) switch (Figure 1, Item 1) to setting for expected road/terrain conditions and allow tractor to sit until selected CTIS indicator (Figure 1, Item 2) remains lit for that CTIS setting.



HETT0083

Figure 1. Loading Able Payload.

3. Couple tractor to semitrailer (WP 0013).
4. Align back of tractor/semitrailer combination as close as possible to payload, approximately 15 ft (4.6 m), on ground, as level as possible.

WARNING



Whenever possible, load the semitrailer on level ground. In adverse conditions, loading can be done on grades up to 10 percent with a maximum offset angle of 10 degrees between the tractor and the semitrailer. Avoid exceeding these limitations to prevent the payload from rolling on the semitrailer. Failure to follow this warning may result in serious injury to personnel and damage to equipment.

5. Visually check tractor/semitrailer offset angle by having spotter check relationship between steering wedge bolt and weld circle at bottom rear of pickup plate. If inside edge of bolt aligns with outside edge of weld circle, offset angle is 10 degrees (Figure 2). Make any required adjustments to tractor.

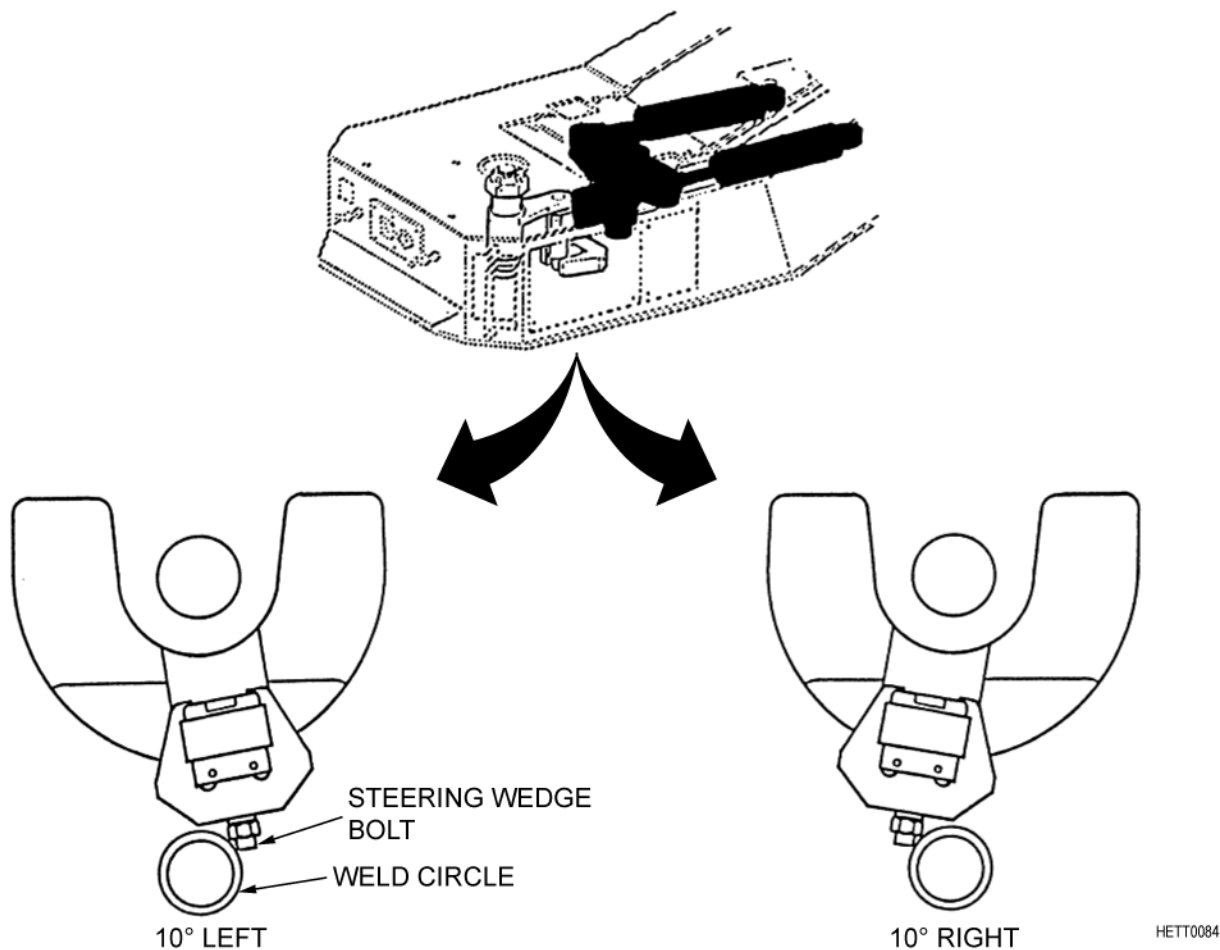


Figure 2. Loading Able Payload.

6. Apply tractor parking brakes by pulling out parking brake valve (Figure 3, Item 1).
7. Remove four wheel chocks (Figure 3, Item 2) from stowage on tractor (TM 9-2320-360-10) chock wheels on both sides of tractor.

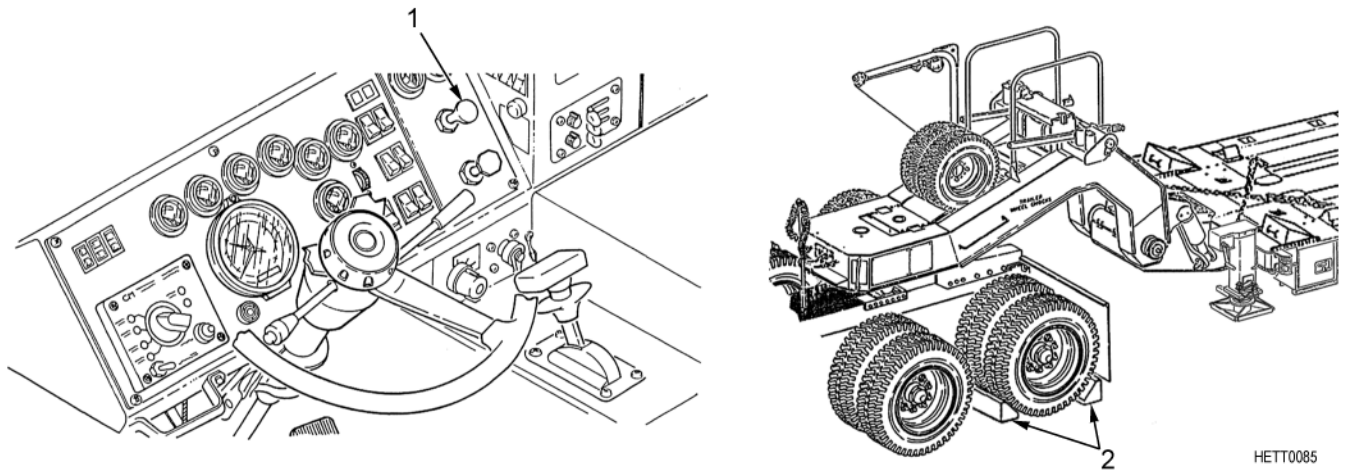


Figure 3. Loading Able Payload.

8. Remove ten capscrews (Figure 4, Item 3), washers (Figure 4, Item 4), and four sheets (Figure 4, Item 5) from two rear payload chocks (Figure 4, Item 1).
9. Remove two rear payload chocks (Figure 4, Item 1) from platform (Figure 4, Item 2).

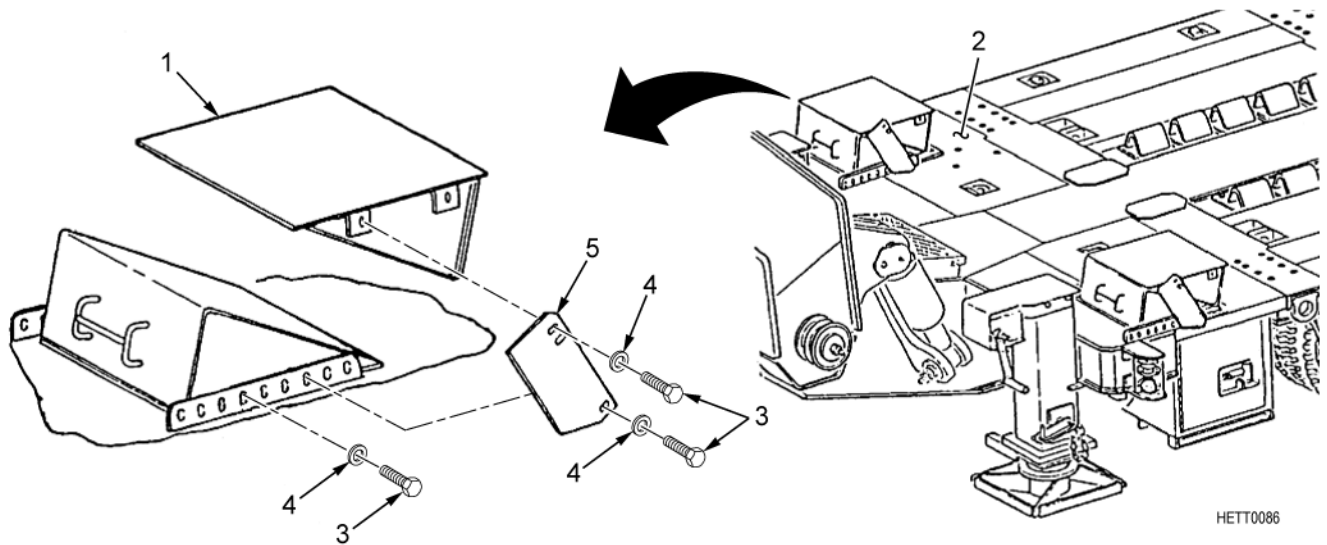


Figure 4. Loading Able Payload.

NOTE

Prior to loading, the front payload chocks must be adjusted to accommodate the offset of road-wheels on the M1 tank, which will release the tank's braking system.

10. Position streetside front payload chock (Figure 5, Item 2) approximately 10 in. (25 cm) from forward edge of platform (Figure 5, Item 6).
11. Position curbside front payload chock (Figure 5, Item 1) approximately 14 in. (35 cm) from forward edge of platform (Figure 5, Item 6).
12. Align forward mounting holes (Figure 5, Item 7) of streetside and curbside payload chocks (Figure 5, Item 1 and Item 2) with fourth hole (Figure 5, Item 8) from front of outboard payload chock mounting brackets (Figure 5, Item 5) on platform (Figure 5, Item 6).
13. Secure each payload chock (Figure 5, Item 1 and Item 2) with two capscrews (Figure 5, Item 3) and washers (Figure 5, Item 4).

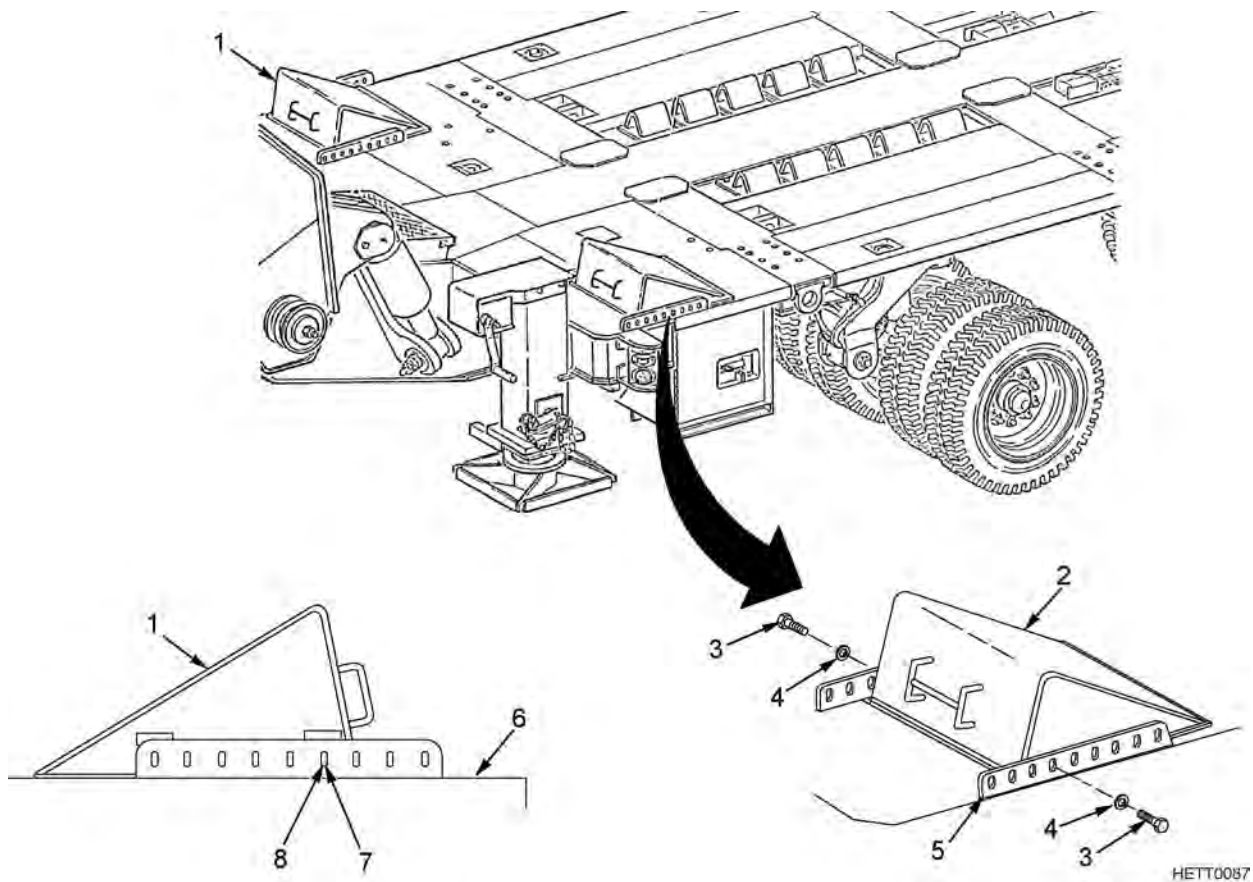
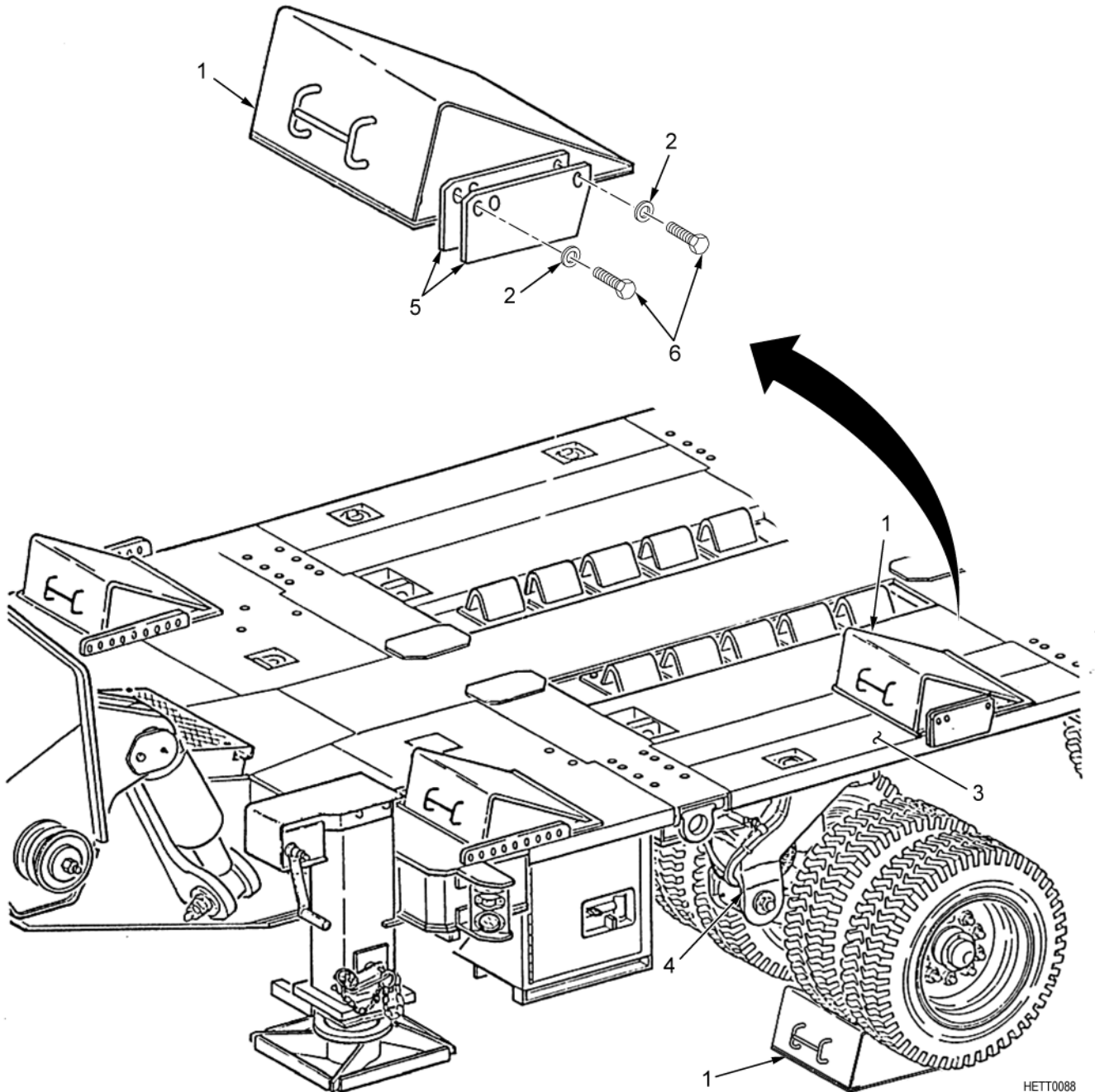
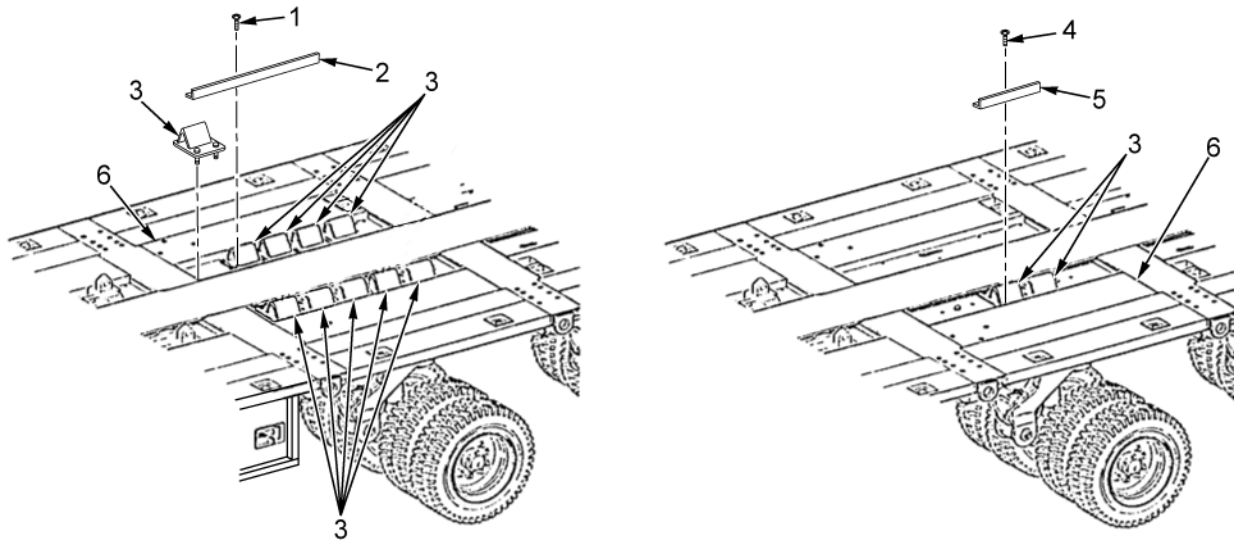


Figure 5. Loading Able Payload.

14. Install two sheets (Figure 6, Item 5) on outboard side of each of two rear payload chocks (Figure 6, Item 1) using four capscrews (Figure 6, Item 6) and washers (Figure 6, Item 2).
15. Position curbside rear payload chock (Figure 6, Item 1) on streetside of platform (Figure 6, Item 3) over first bogie (Figure 6, Item 4). Place streetside rear payload chock (Figure 6, Item 1) on the ground at streetside of semitrailer.



16. Remove two capscrews (Figure 7, Item 1) and curb guide stowage brackets (Figure 7, Item 2) from forward recessed area on platform (Figure 7, Item 6).
17. Remove capscrew (Figure 7, Item 4) and curb guide stowage bracket (Figure 7, Item 4) from aft recessed area on platform (Figure 7, Item 6).
18. Remove all 12 curb guides (Figure 7, Item 3) from stowage points on platform (Figure 7, Item 6).
19. Install curb guide stowage bracket (Figure 7, Item 2) and capscrew (Figure 7, Item 1) in forward recessed area on platform (Figure 7, Item 6).



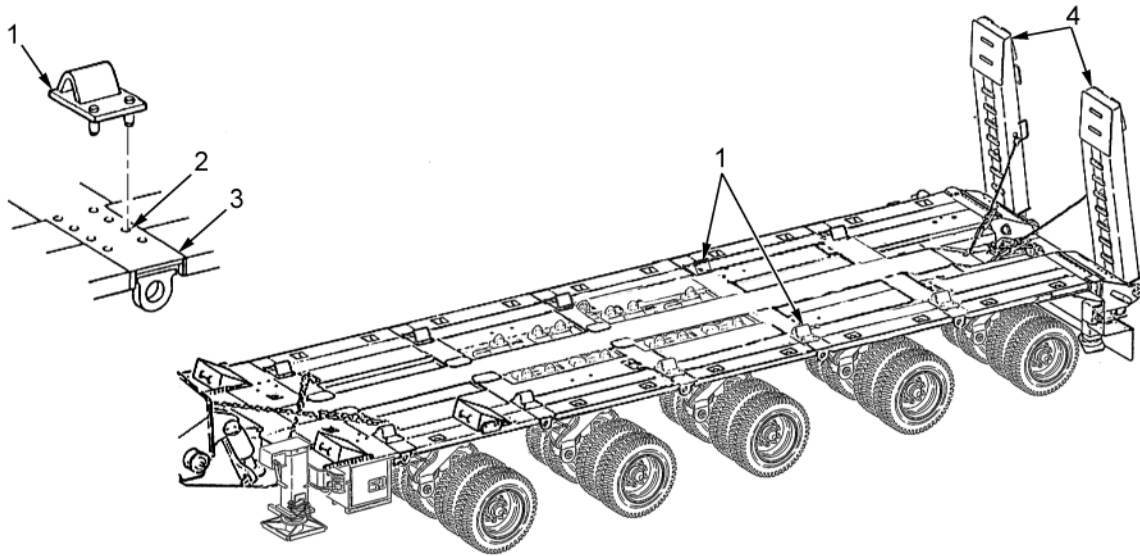
HETT0089

Figure 7. Loading Able Payload.

NOTE

Two curb guides will be installed on the beavertail after the loading ramps are lowered.

20. Install ten curb guides (Figure 8, Item 1) (five on each side) in second hole (Figure 8, Item 2) inward from platform edge (Figure 8, Item 3) (pin side facing outboard from center of platform). Set two remaining curb guides (Figure 8, Item 1) aside until ramps (Figure 8, Item 4) are lowered.



HETT0090

Figure 8. Loading Able Payload.

WARNING

- Due to semitrailers being outfitted with various chains (1/2 in. (1.3 cm) and/or 3/4 in. (1.9 cm) link sizes), all chains must be inventoried in the platform storage compartment prior to placing the chains on the platform.
- Once the chains are inventoried, read and familiarize yourself with the information in steps 21 through 41 to determine tiedown needed to properly secure the payload.

Failure to follow these warnings may result in injury to personnel and damage to equipment.

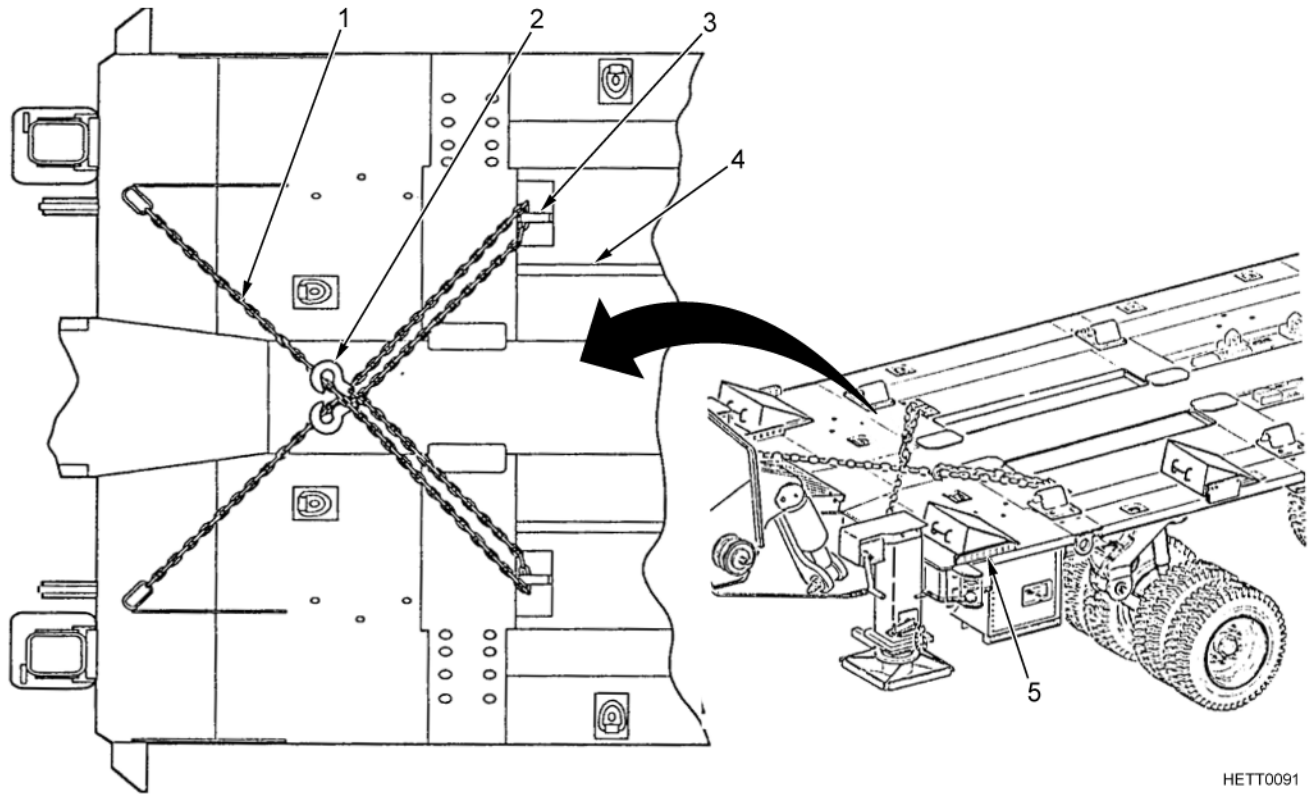
CAUTION

- Ensure chains and load binders are positioned inward of both curbside and streetside curb guides. Failure to follow this caution may result in damage to equipment when payload is loaded.
- Chains must be the same length and must be properly laid out, or loaded payload will contact gooseneck and damage to equipment may result.

NOTE

- Determine the size of all tiedown chains.
- Follow steps 21 through 41 to determine tiedown requirements and arrange payload tiedown chains.
- With chains crossed, the pear-shaped end link should be approximately in front of the inboard payload chock stowage bracket.

21. Loop two 11 ft (3.4 m) front tiedown chains (Figure 9, Item 1) (either 3/4 in. (1.9 cm) or 1/2 in. (1.3 cm) link size) through two front tiedown rings (Figure 9, Item 3) recessed in platform (Figure 9, Item 4).
22. Hook chains (Figure 9, Item 1) back to themselves so that each pear-shaped end link (Figure 9, Item 2) is approximately in front of inboard payload chock stowage bracket (Figure 9, Item 5). Ensure chains (Figure 9, Item 1) are same length.
23. Lay both chains (Figure 9, Item 1) so that they cross near front of platform (Figure 9, Item 4).



HETT0091

Figure 9. Loading Able Payload.

24. Extend four load binders (Figure 10, Item 6) to show approximately 6.5 in. (16.5 cm) of thread on both ends.
25. Remove two shackles (Figure 10, Item 7) from platform stowage compartment and position shackles near rear payload tiedown ring (Figure 10, Item 1), which is recessed in platform (Figure 10, Item 3).

NOTE

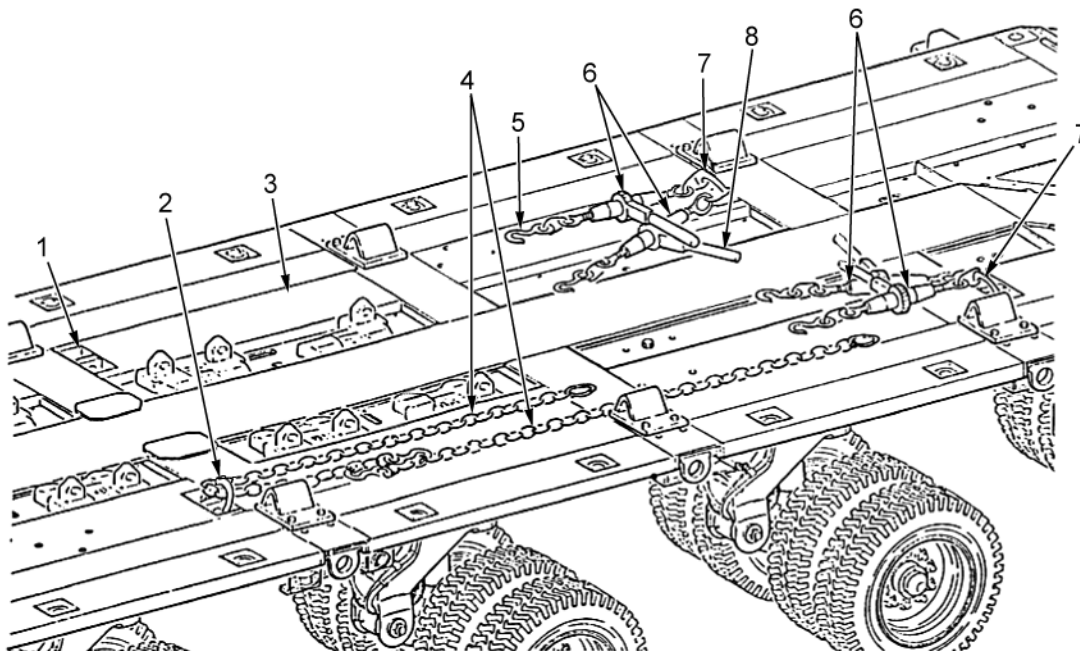
When laying out load binders, ensure parallel load binder is on outboard side of shackle and angled load binder is on inboard side of shackle to prevent load binders from interfering with each other.

26. Using two shackles (Figure 10, Item 7), secure two load binders (Figure 10, Item 6), small end of pear link (Figure 10, Item 5) toward load binder, to each rear payload tiedown ring (Figure 10, Item 1).
27. For each pair of load binders (Figure 10, Item 6), place one load binder parallel to edge of platform (Figure 10, Item 3) pointed toward front, and other load binder angled toward center of platform. Position handles (Figure 10, Item 8) inboard.

NOTE

Perform steps 28 through 31 to lay out streetside parallel tiedown chains.

28. If using 3/4 in. (1.9 cm) link chains, hook two 11 ft (3.4 m) chains (Figure 10, Item 4) together.
29. If using 1/2 in. (1.3 cm) link chains, select one 19 ft chain (5.8 m) (Figure 10, Item 4).
30. Route chains (Figure 10, Item 4) forward from streetside parallel load binder (Figure 10, Item 6), parallel with edge of platform (Figure 10, Item 3), through large shackle (Figure 10, Item 2) (from platform stowage compartment) in streetside center tiedown ring (Figure 10, Item 1).
31. Pass chains (Figure 10, Item 4) back toward rear of platform (Figure 10, Item 3). If using 3/4 in. (1.9 cm) chains (Figure 10, Item 4), ensure junction of the two 3/4 in. (1.9 cm) chains is aft of large shackle (Figure 10, Item 2). DO NOT connect chains to load binder (Figure 10, Item 6).



HETT0092

Figure 10. Loading Able Payload.

NOTE

Perform steps 32 through 35 to lay out curbside parallel tiedown chains.

32. If using 3/4 in. (1.9 cm) link chains, hook one 11 ft (3.4 m) chain (Figure 11, Item 2) and one 4 ft (1.2 m) chain (Figure 11, Item 4) together. Lay 4 ft (1.2 m) chain (Figure 11, Item 4) alongside the curbside parallel load binder (Figure 11, Item 6).
33. Route 11 ft (3.4 m) chain (Figure 11, Item 2) forward, parallel with curbside edge of platform (Figure 11, Item 3), and inward through large shackle (Figure 11, Item 1) (from platform stowage compartment), and install shackle in curbside center tiedown ring (Figure 11, Item 8).
34. If using 1/2 in. (1.3 cm) link chain, select one 19 ft (5.8 m) chain (Figure 11, Item 2). Route chain forward from curbside parallel load binder (Figure 11, Item 6), parallel with edge of platform (Figure 11, Item 3), through large shackle (Figure 11, Item 1) (from platform stowage compartment), and install shackle in curbside center tiedown ring (Figure 11, Item 8).
35. Pass chains (Figure 11, Item 2) back toward rear of platform (Figure 11, Item 3). DO NOT connect chains to load binder (Figure 11, Item 6).

NOTE

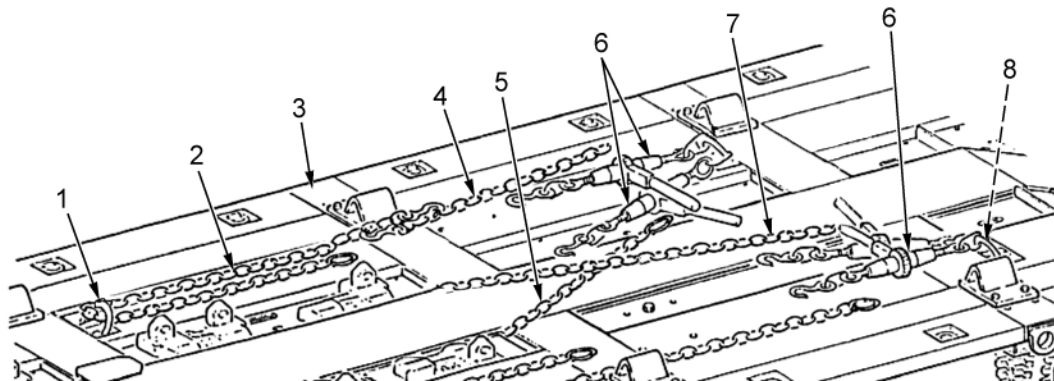
Perform steps 36 through 38 to lay out curbside angle rear payload tiedown chains.

36. If using 3/4 in. (1.9 cm) link chain, place 4 ft (1.2 m) chain (Figure 11, Item 5) from curbside angled load binder (Figure 11, Item 6) forward, toward center of platform (Figure 11, Item 3).
37. If using 1/2 in. (1.3 cm) link chain, place 7 ft (2.1 m) chain (Figure 11, Item 5) from curbside angled load binder (Figure 11, Item 6) forward, toward center of platform (Figure 11, Item 3).
38. DO NOT connect angle rear tiedown chains (Figure 11, Item 5) to load binder (Figure 11, Item 6).

NOTE

Perform steps 39 through 41 to lay out streetside angle rear payload tiedown chains.

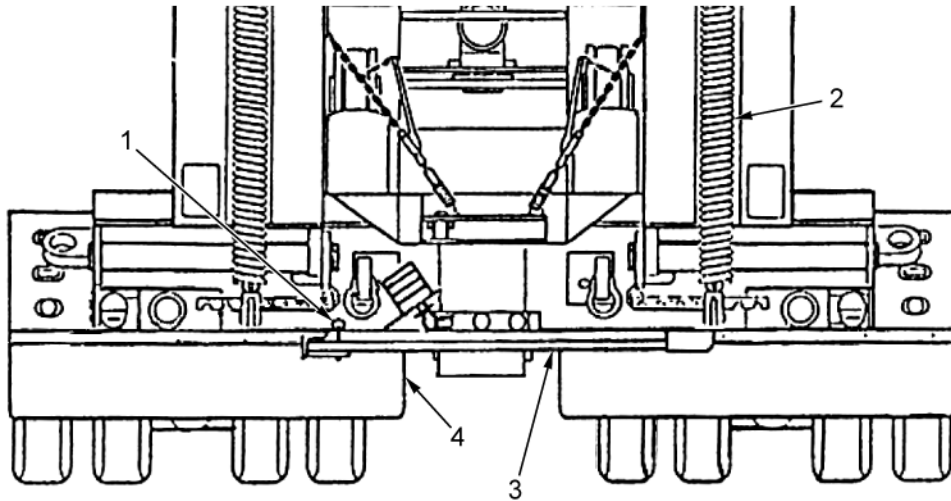
39. If using 3/4 in. (1.9 cm) link chain, place 11 ft (3.4 m) chain (Figure 11, Item 7) from streetside angled load binder (Figure 11, Item 6) forward, toward center of platform (Figure 11, Item 3).
40. If using 1/2 in. (1.3 cm) link chain, place 7 ft (2.1 m) chain (Figure 11, Item 7) from streetside angled load binder (Figure 11, Item 6) forward, toward center of platform (Figure 11, Item 3).
41. DO NOT connect angle rear tiedown chain (Figure 11, Item 7) to load binder (Figure 11, Item 6).



HETT0093

Figure 11. Loading Able Payload.

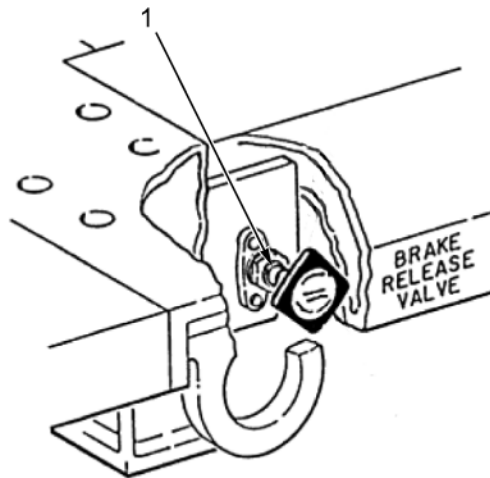
42. Remove hitch pins (Figure 12, Item 1) and crowbar (Figure 12, Item 3) from rear of semitrailer (Figure 12, Item 4) below loading ramps (Figure 12, Item 2). Reinstall hitch pins to rear of semitrailer.



HETT0094

Figure 12. Loading Able Payload.

43. Raise ramps perpendicular to platform and adjust ramp span width to match payload (WP 0009).
44. Start and run APU (WP 0005).
45. Release semitrailer parking brakes by pushing inward on knob of brake release valve (Figure 13, Item 1).



HETT0095

Figure 13. Loading Able Payload.

46. Raise front of semitrailer to 50 in. (127 cm) to top mark on crowbar (WP 0008).
47. Lower rear of semitrailer to approximately 34 in. (86 cm) to bottom mark on crowbar (Figure 14).

CAUTION

Failure to lower rear support legs while loading and unloading payloads may result in severe equipment damage (i.e., upper suspension casting cracks, blown tires).

48. Lower rear support legs until feet are in firm contact with ground (WP 0012). Turn adjusting nut as necessary to position socket head screw outboard and close cover.
49. Unhook loading ramp stow chains and lower loading ramps to ground (WP 0009).

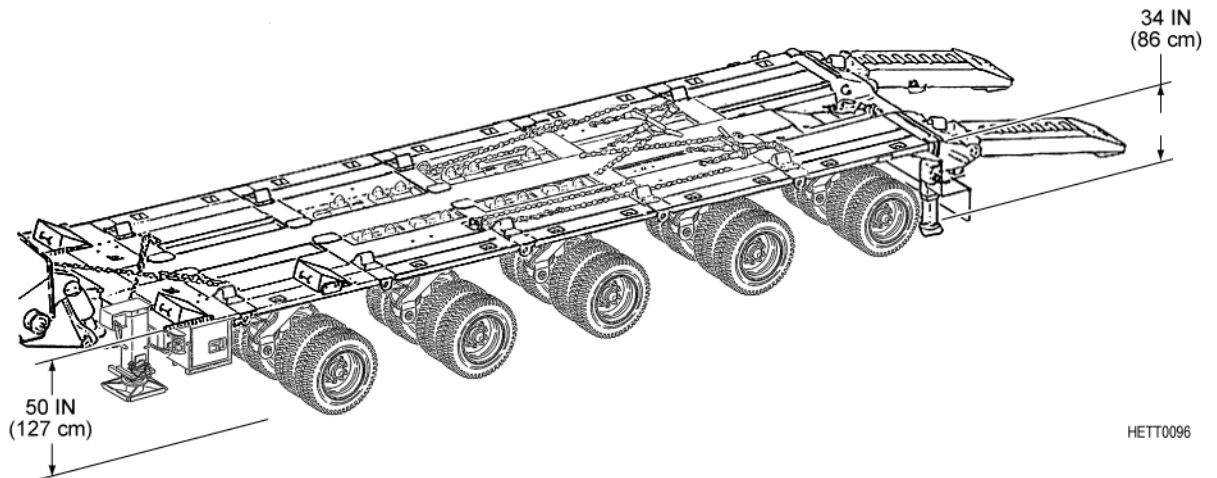


Figure 14. Loading Able Payload.

50. Apply semitrailer parking brakes by pulling outward on knob of brake release valve (Figure 15, Item 1).

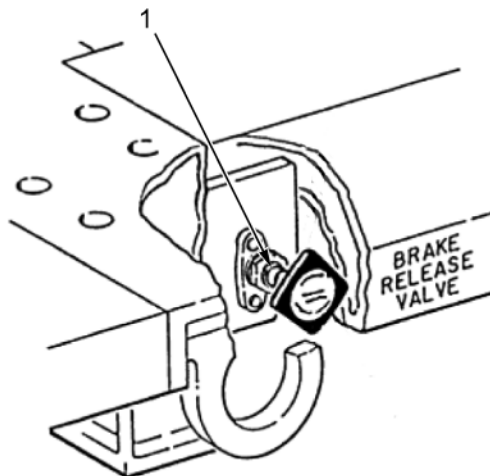
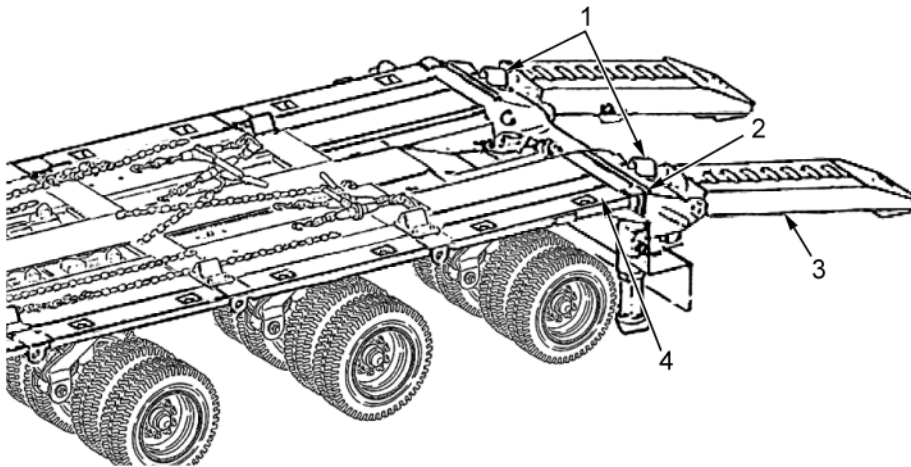


Figure 15. Loading Able Payload.

51. Align and install two curb guides (Figure 16, Item 1) in second hole inward from platform edge at beavertail (Figure 16, Item 2), just in front of each loading ramp (Figure 16, Item 3). Ensure pin side of each curb guide faces outward from center of platform (Figure 16, Item 4).



HETT0732

Figure 16. Loading Able Payload.

WARNING



- Two spotters are required for loading and unloading operations. The payload operator must know the position of spotters at all times.
- If payload is to be backed onto semitrailer platform, DO NOT position a spotter on gooseneck.

Failure to follow these warnings may result in injury to personnel.

WARNING



On some semitrailers, a solar battery charger is mounted on top of the gooseneck directly in front of the spare tires. Persons working on top of the gooseneck must take **EXTREME** care not to step on the solar battery charger or trip over it. Failure to follow this warning may result in injury to personnel or damage to equipment.

NOTE

Follow steps 52 through 54 to position spotters.

52. Position one spotter on gooseneck (Figure 17, Item 1) to ensure constant visual contact with payload operator.
53. If backing payload (Figure 17, Item 3) onto semitrailer platform (Figure 17, Item 2), position spotter behind payload facing forward. Spotter must be in constant view of payload operator.

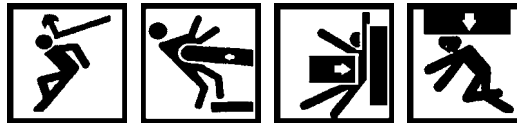
54. Position one spotter on curbside of payload (Figure 17, Item 3) to maintain visual contact with spotter located either on gooseneck (Figure 17, Item 1) or at back of payload facing payload operator.

CAUTION

Ensure all chains and load binder handles are inward of the curb guides and are clear of the payload tracks, or damage to equipment may occur.

55. Start and warm payload (Figure 17, Item 3). Align payload to semitrailer (Figure 17, Item 2) prior to loading (center of payload to center of semitrailer).

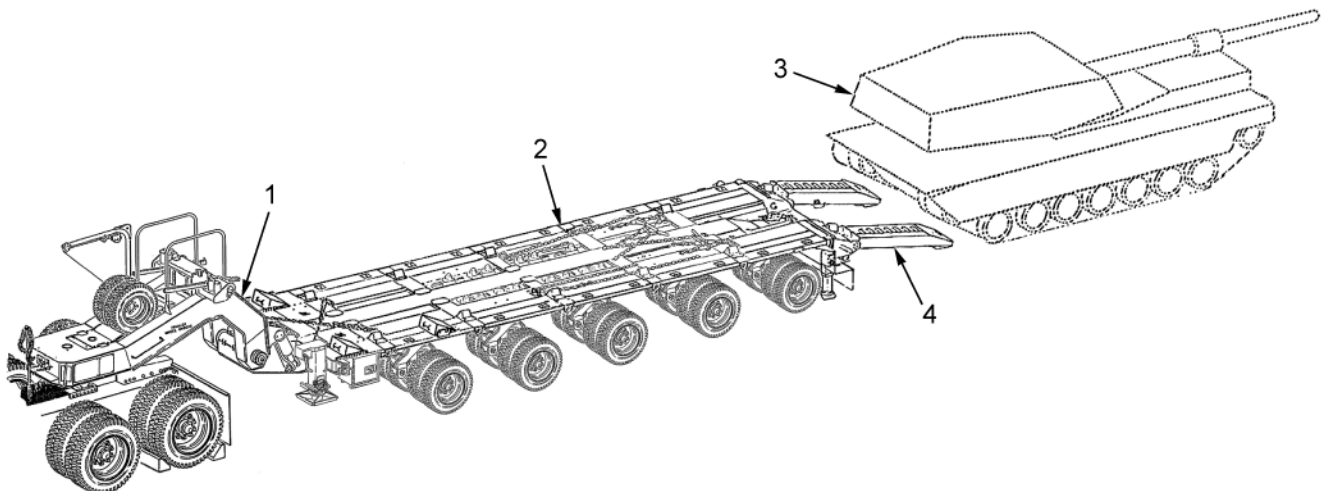
WARNING



- **Unnecessary personnel must stand well clear of the vehicles, especially behind the payload (engine/turbine exhaust) during loading operations.**
- **At no time during any loading operation while the payload is moving should personnel be on the semitrailer platform.**
- **The payload operator must drive the payload slowly up the loading ramps and onto the platform.**
- **Payload adjustments, side to side (turning), must be kept to a minimum.**

Failure to follow these warnings may result in serious injury to personnel and damage to equipment.

56. Using hand signals, gooseneck/aft spotter must signal payload operator to drive payload (Figure 17, Item 3) slowly up onto platform (Figure 17, Item 2). Curbside spotter must notify gooseneck/aft spotter of any required payload adjustments while loading.
57. Have payload operator drive payload (Figure 17, Item 3) onto ramps (Figure 17, Item 4) and platform (Figure 17, Item 2).

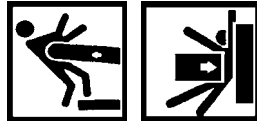


HETT0097

Figure 17. Loading Able Payload.

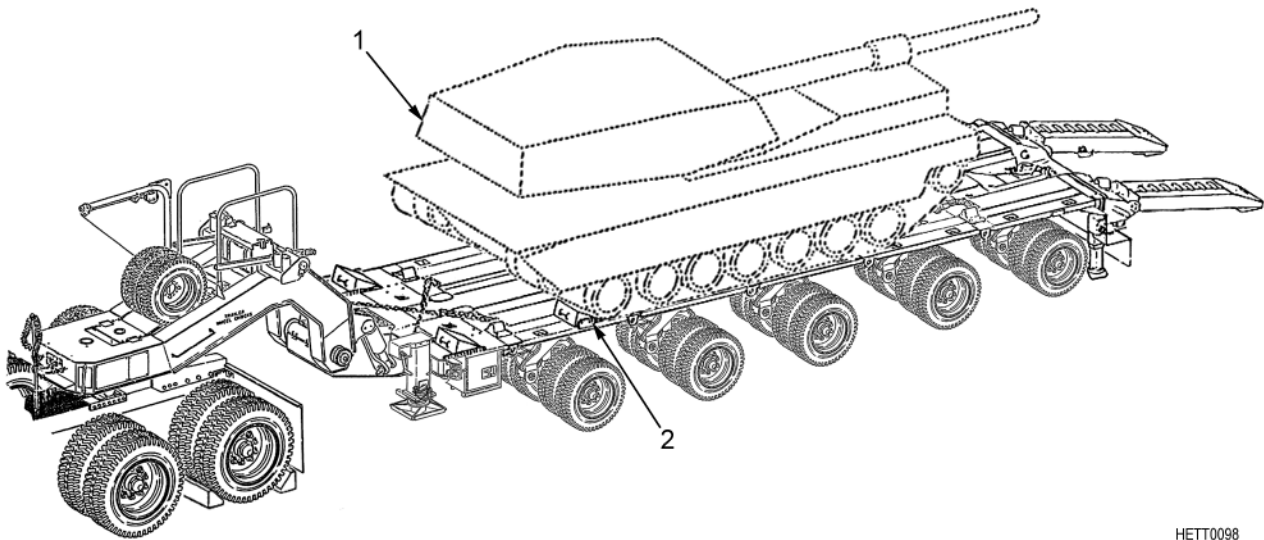
58. Have gooseneck/aft spotter guide payload operator until firm contact has been made with payload chock (Figure 18, Item 2) on streetside.

WARNING



Failure to set the payload parking brake could allow the payload to roll backward. Failure to follow this warning may result in injury to personnel and damage to equipment.

59. Have payload operator apply payload (Figure 18, Item 1) parking brakes.



HETT0098

Figure 18. Loading Able Payload.

60. Chock streetside rear of payload (Figure 19, Item 1) with rear streetside payload chock (Figure 19, Item 4) with two sheets (Figure 19, Item 3) attached. Ensure sheets are positioned flush against side of platform (Figure 19, Item 2) to prevent inward shifting of chocks.

NOTE

Perform steps 61 through 64 to adjust platform to normal running height.

61. Release semitrailer parking brakes by pushing inward on knob of brake release valve (Figure 19, Item 5).
62. Adjust platform height to normal running height of 43 in. (109 cm) (WP 0008).
63. Using bed height indicators, check each corner of platform for a height of 43 in. (109 cm) (WP 0004).
64. Apply semitrailer parking brakes by pulling outward on knob of brake release valve (Figure 19, Item 5).

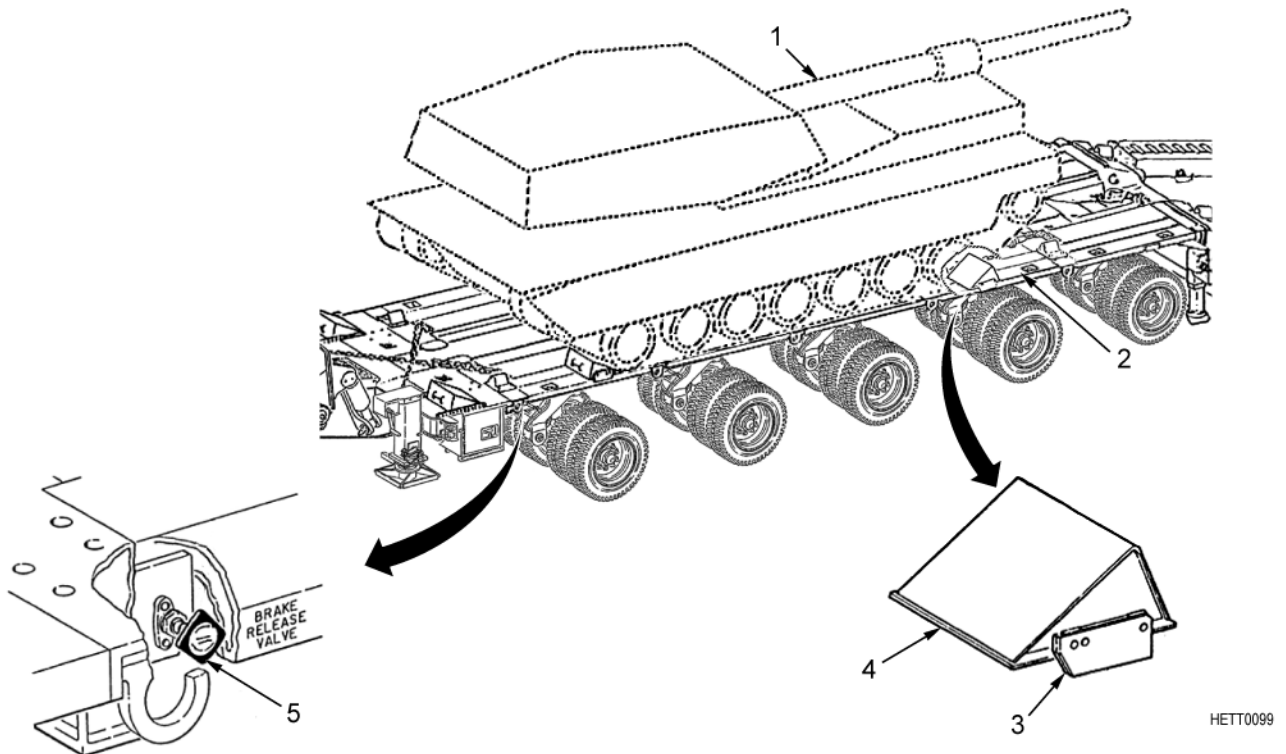


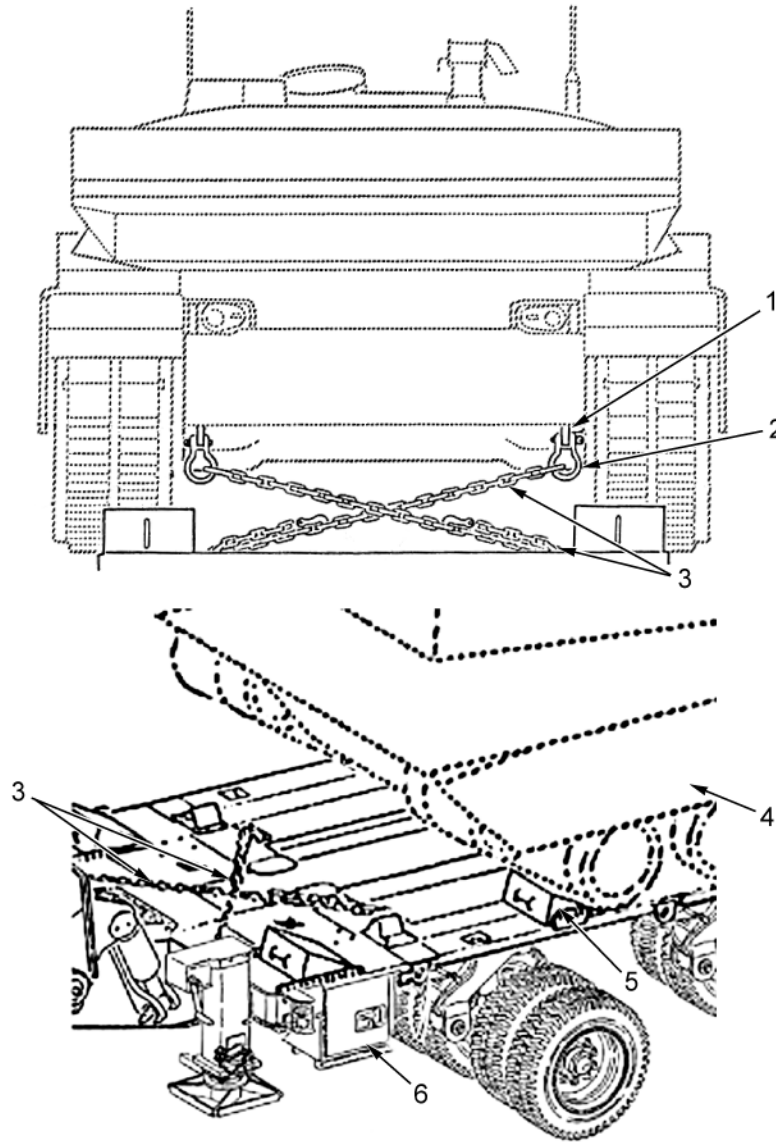
Figure 19. Loading Able Payload.

65. Lift two front tiedown chains (Figure 20, Item 3) and attach chains to two front towing lugs (Figure 20, Item 1) using two shackles (Figure 20, Item 2) from platform stowage compartment (Figure 20, Item 6).

NOTE

It may be necessary to release the payload parking brake, move the rear streetside payload chock back approximately 12 in. (30 cm), and move the payload back slightly to remove the front streetside payload chock.

66. Remove streetside payload chock (Figure 20, Item 5) from front streetside of payload (Figure 20, Item 4).



HETT0100

Figure 20. Loading Able Payload.

67. With aid of an assistant, signal payload operator to drive payload (Figure 21, Item 1) slowly forward until front tiedown chains (Figure 21, Item 2) are tight and payload tracks (front road wheels)(Figure 21, Item 7) are firmly on front payload chocks (Figure 21, Item 6). Apply payload parking brakes (Figure 21, Item 5).

NOTE

Install the payload rear chocks with the sheets positioned flush against the side of the platform to prevent inward shifting of the chocks.

68. Place rear payload chocks (Figure 21, Item 4), with sheets (Figure 21, Item 3) attached, rear curbside and streetside of payload (Figure 21, Item 1).

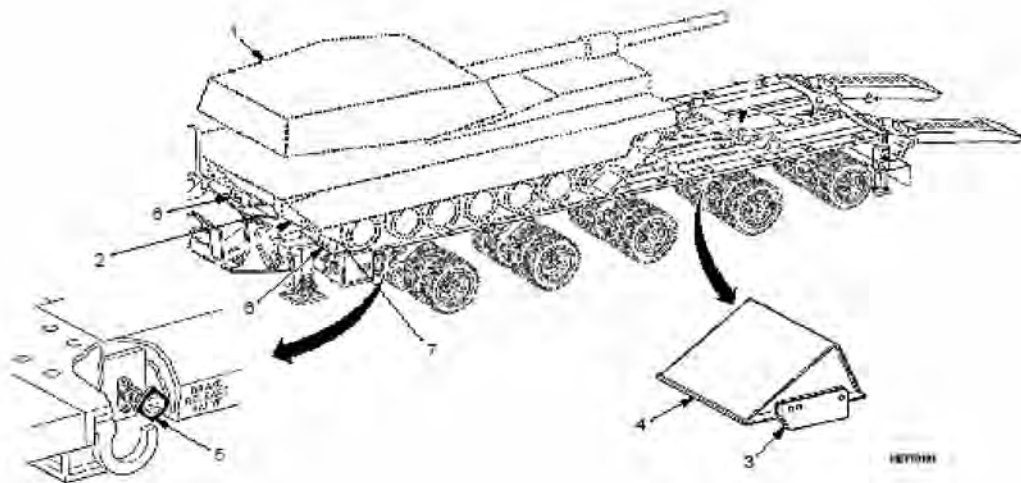


Figure 21. Loading Able Payload.

NOTE

- The streetside parallel chain consists of either two 11 ft (3.3 m) chains with 3/4 in. (1.9 cm) links, or a 19 ft (5.8 m) chain with the 1/2 in. (1.3 cm) links.
- The curbside angle rear payload tiedown chain consists of either a 4 ft (1.2 m) chain with 3/4 in. (1.9 cm) links, or the 7 ft (2.1 m) chain with the 1/2 in. (1.3 cm) links.
- Perform steps 69 through 79 to shut down payload and secure payload to semitrailer platform.
- Remove two shackles from platform stowage compartment.

69. Attach streetside parallel chain (Figure 22, Item 9) and curbside angle rear payload tiedown chain (Figure 22, Item 3) to streetside rear towing lug (Figure 22, Item 1) using shackle (Figure 22, Item 2).

NOTE

- The curbside parallel chain consists of either the 11 ft (3.4 m) and 4 ft (1.2 m) chain combination with the 3/4 in. (1.9 cm) links, or the 19 ft (5.8 m) chain with the 1/2 in. (1.3 cm) links.
- The streetside angle rear payload tiedown chain consists of either the 11 ft (3.4 m) chain with the 3/4 in. (1.9 cm) links, or the 7 ft (2.1 m) chain with the 1/2 in. (1.3 cm) links.

70. Attach curbside parallel tiedown chains (Figure 22, Item 5 or Figure 22, Item 5 and Item 6) and streetside angle rear payload tiedown chains (Figure 22, Item 4) to curbside rear towing lug (Figure 22, Item 1) using shackle (Figure 22, Item 2).

NOTE

When attaching the load binders to the tiedown chains, remove as much slack as possible. The remaining slack can be removed when the load binders are operated.

71. Attach both parallel chains (Figure 22, Item 9 and Item 5, or Figure 22, Item 9, Item 5, and Item 6) to four parallel positioned load binders (Figure 22, Item 8).
72. Operate four load binders (Figure 22, Item 8) to tighten two parallel tiedown chains (Figure 22, Item 9 and Item 5 or Figure 22, Item 9, Item 5, and Item 6).

NOTE

- When attaching the load binders to the tiedown chains, remove as much slack as possible. The remaining slack can be removed when the load binders are operated.
- Both the curbside and streetside angle rear payload tiedown chains are attached to the angled load binders the same way. Curbside chains are shown.

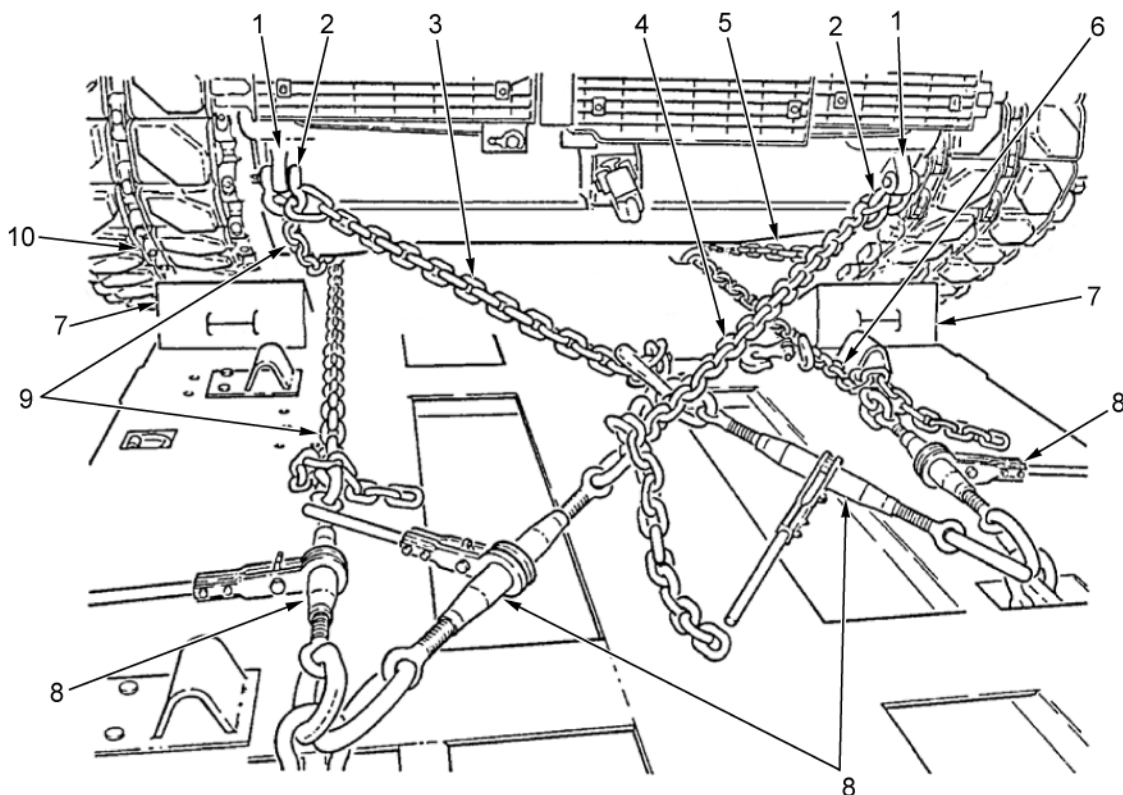
73. Attach free end of curbside angle rear payload tiedown chains (Figure 22, Item 3) to curbside angled load binder (Figure 22, Item 8).

CAUTION

The streetside angle rear payload tiedown chains must cross over the top of the curbside rear payload tiedown chains or the chains will interfere with each other, resulting in damage to equipment.

74. Attach free end of streetside angle rear payload tiedown chains (Figure 22, Item 4), passing chains over top of curbside angle rear payload tiedown chains (Figure 22, Item 3), to streetside angled load binder (Figure 22, Item 8).

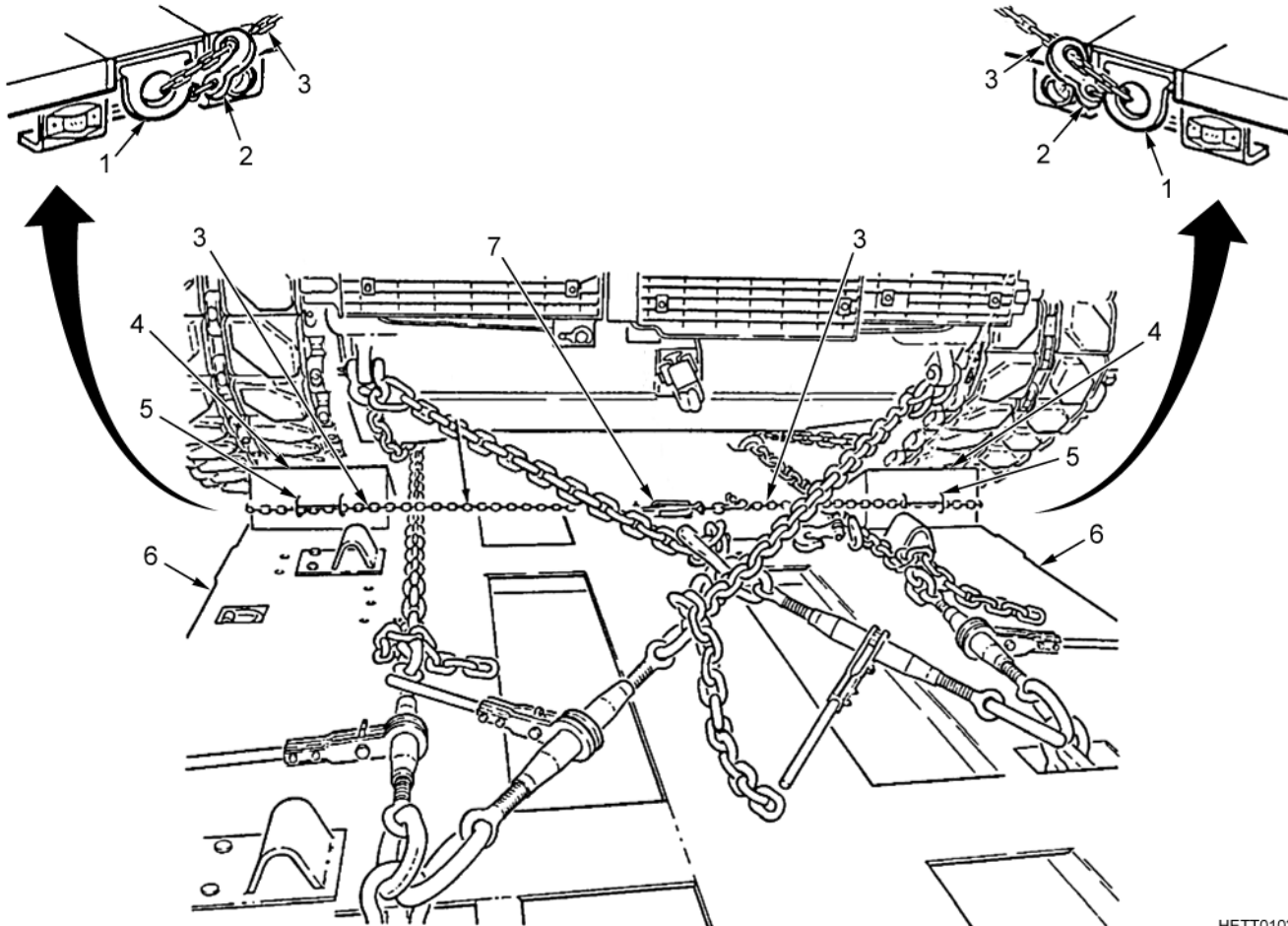
75. Operate both load binders (Figure 22, Item 8) to tighten both angle rear payload tiedown chains (Figure 22, Item 3 and Item 4). Ensure payload (Figure 22, Item 10) is secure against two rear payload chocks (Figure 22, Item 7).



HETT0102

Figure 22. Loading Able Payload.

76. Attach two 11 ft (3.3 m) utility chains (Figure 23, Item 3) through tiedown ring (Figure 23, Item 1) on each side of platform (Figure 23, Item 6) just forward of each payload chock (Figure 23, Item 4). Connect hook (Figure 23, Item 2) to each chain.
77. Pass free end of utility chains (Figure 23, Item 3) through both handles (Figure 23, Item 5) of both rear payload chocks (Figure 23, Item 4). Place free ends of both utility chains at center of platform (Figure 23, Item 6).
78. Attach load binder (Figure 23, Item 7) to both utility chains (Figure 23, Item 3), removing as much slack as possible.
79. Operate load binder (Figure 23, Item 7) to tighten both utility chains (Figure 23, Item 3).



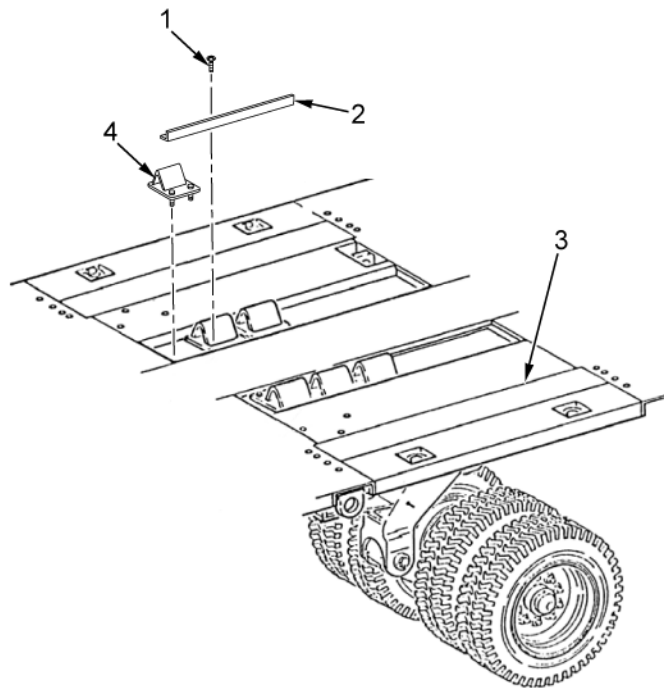
HETT0103

Figure 23. Loading Able Payload.

NOTE

Store the curb guides in the foremost three positions on each side in the recessed areas of the platform.

80. Remove six curb guides (Figure 24, Item 4) from rear of platform (Figure 24, Item 3).
81. Install six curb guides (Figure 24, Item 4) with two curb guide stowage brackets (Figure 24, Item 2) and capscrews (Figure 24, Item 1).
82. Raise ramps and adjust ramp span width to furthest inward position and stow loading ramps for transport (WP 0009).
83. Shut down APU (WP 0005).
84. Raise rear support legs (WP 0009).
85. Stow crowbar at back of platform and secure in place with hitch pins (WP 0002).
86. Stow all tools used during loading procedure in platform stowage compartment (WP 0002).
87. Remove four wheel chocks from tractor tires and restow wheel chocks onto tractor (TM 9-2320-360-10).
88. If applicable, also remove four semitrailer chocks and restow on semitrailer gooseneck (WP 0035).



HETT0104

Figure 24. Loading Able Payload.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**OPERATION UNDER USUAL CONDITIONS - UNLOADING ABLE PAYLOADS**

INITIAL SETUP:**Personnel Required**

2

WP 0012

WP 0015

WP 0016

References

WP 0005

WP 0025

WP 0009

TM 9-2320-360-10

GENERAL INFORMATION

This work package contains instructions for unloading able payloads from the Heavy Equipment Transporter (HET) semitrailer.

UNLOADING ABLE PAYLOADS

WARNING

- **Unload the semitrailer on level ground whenever possible. In adverse conditions, unloading can be done on grades up to 10 percent with a maximum offset angle of 10 degrees between the tractor and semitrailer.**
 - **Avoid exceeding this limitation to prevent the payload from rolling off of the semitrailer.**
- Failure to follow these warnings may result in injury to personnel and damage to equipment.**

NOTE

If the tractor and semitrailer are already coupled, proceed to step 2.

1. If tractor and semitrailer are uncoupled, perform steps 1 through 3 of Loading Able Payloads (WP 0015).
2. Align back of tractor/semitrailer combination with area to be unloaded (WP 0025). Ensure ample amount of space is provided for ramps to be lowered and payload to be off-loaded past end of ramps on ground as level as possible.
3. Visually check tractor/semitrailer offset angle by having spotter check relationship between steering wedge bolt and weld circle at bottom rear of pickup plate. If inside edge of bolt aligns with outside edge of weld circle, offset angle is 10 degrees. Make any required adjustments to tractor (Figure 1).

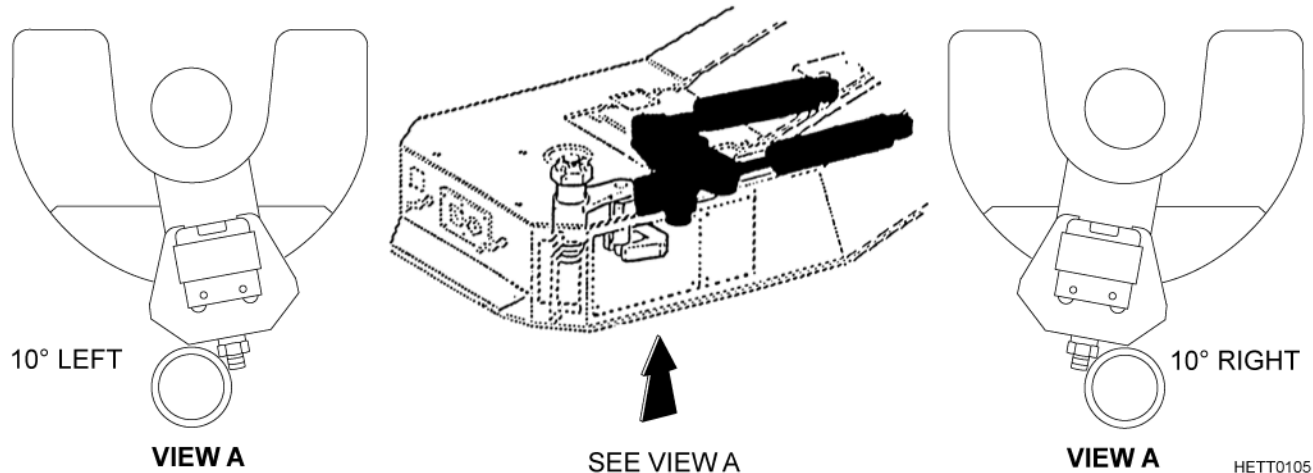
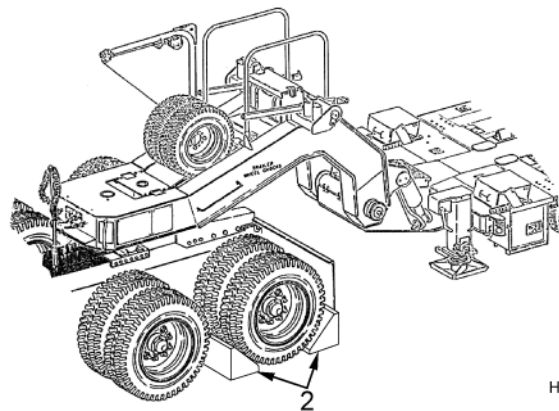
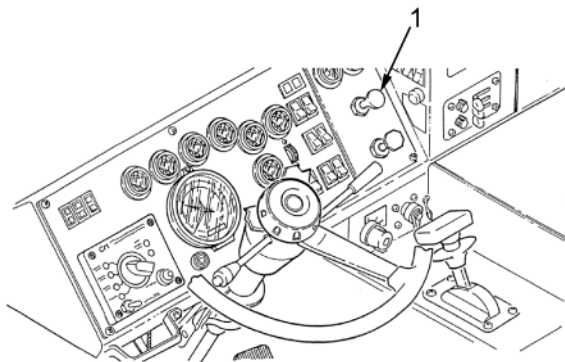


Figure 1. Unloading Able Payloads.

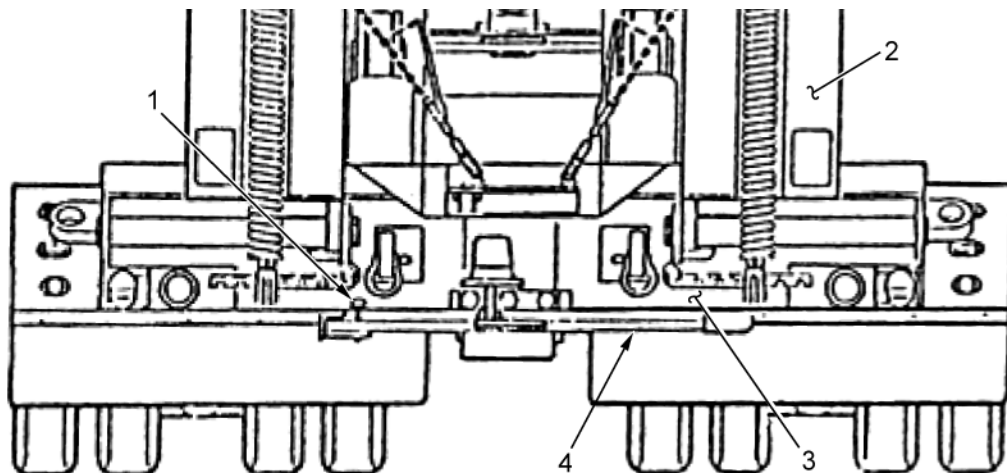
4. Apply tractor parking brakes by pulling out parking brake valve (Figure 2, Item 1). Remove four wheel chocks (Figure 2, Item 2) from stowage on tractor and chock wheels on tractor.



HETT0106

Figure 2. Unloading Able Payloads.

5. Remove hitch pins (Figure 3, Item 1) and crowbar (Figure 3, Item 4) from rear of semitrailer (Figure 3, Item 3) below loading ramps (Figure 3, Item 2). Reinstall hitch pins.



HETT0107

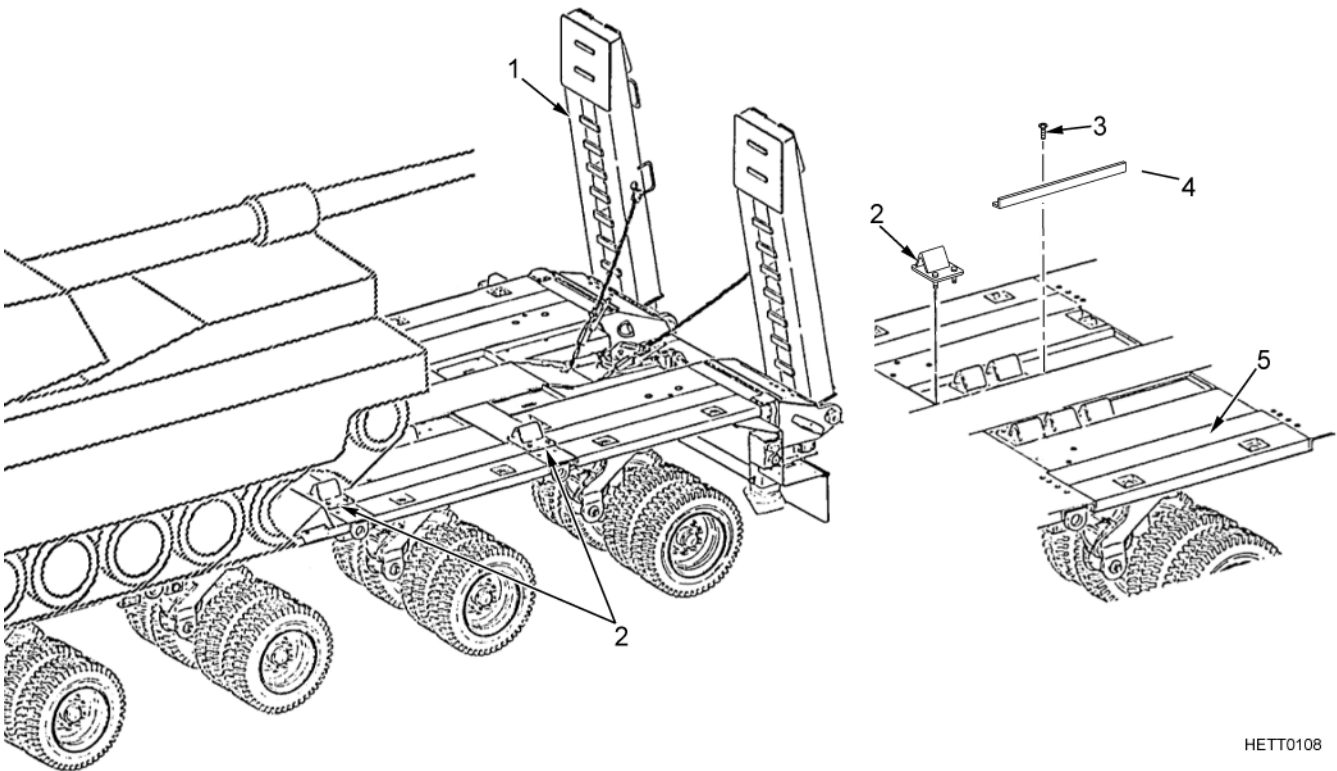
Figure 3. Unloading Able Payloads.

6. Adjust ramp span width to match payload track width as required (WP 0009).
7. Remove six curb guides (Figure 4, Item 2) from rear recessed area of platform (Figure 4, Item 5) by removing two capscrews (Figure 4, Item 3) and curb guide stowage brackets (Figure 4, Item 4).

NOTE

Two curb guides will be installed on beavertail after the loading ramps are lowered.

8. Place four curb guides (Figure 4, Item 2) (two on each side) on platform (Figure 4, Item 5) in second hole inward from platform edge (pinside facing outboard from center of platform). Set two remaining curb guides aside until ramps (Figure 4, Item 1) are lowered.



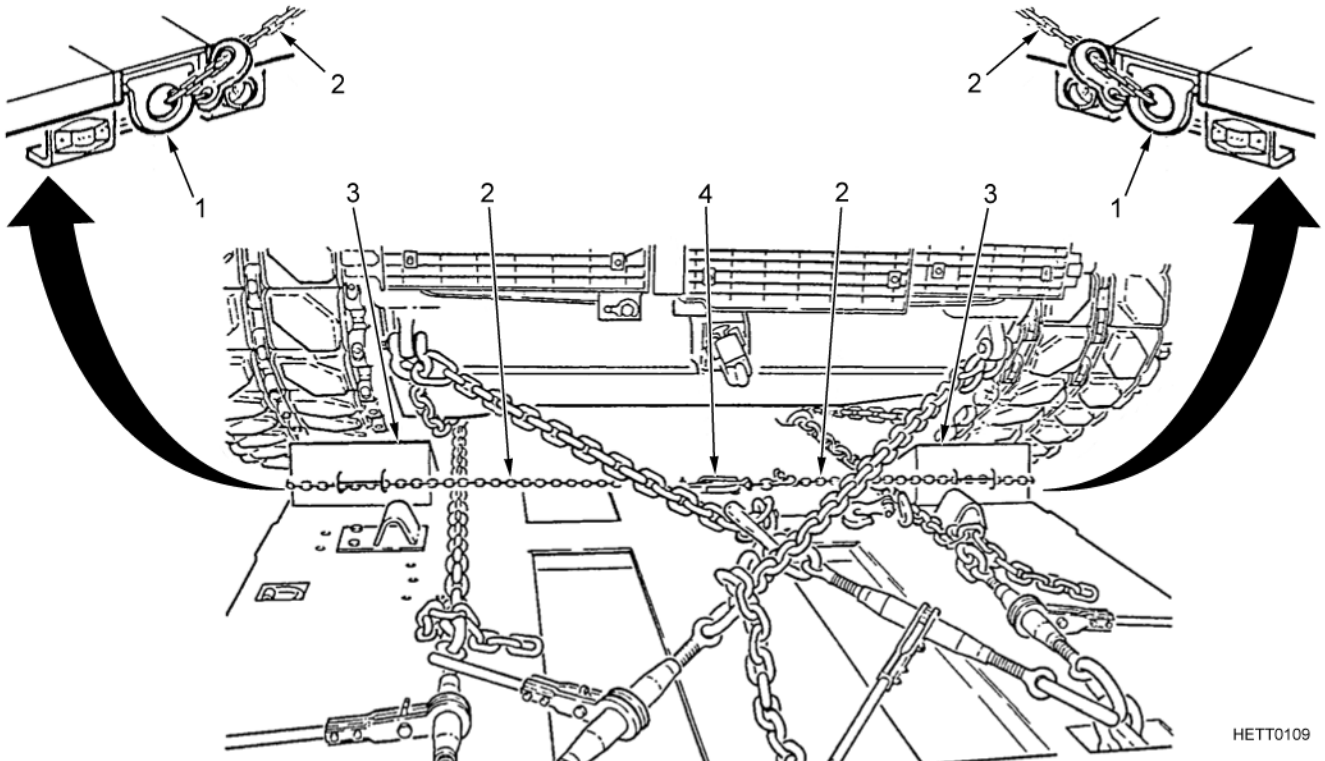
HETT0108

Figure 4. Unloading Able Payloads.

NOTE

Perform steps 9 through 20 to remove payload tiedowns and payload chock tiedowns from payload.

9. Open load binder (Figure 5, Item 4) and remove two utility chains (Figure 5, Item 2) from two tiedown rings (Figure 5, Item 1). Remove utility chains from two rear payload chocks (Figure 5, Item 3).



HETT0109

Figure 5. Unloading Able Payloads.

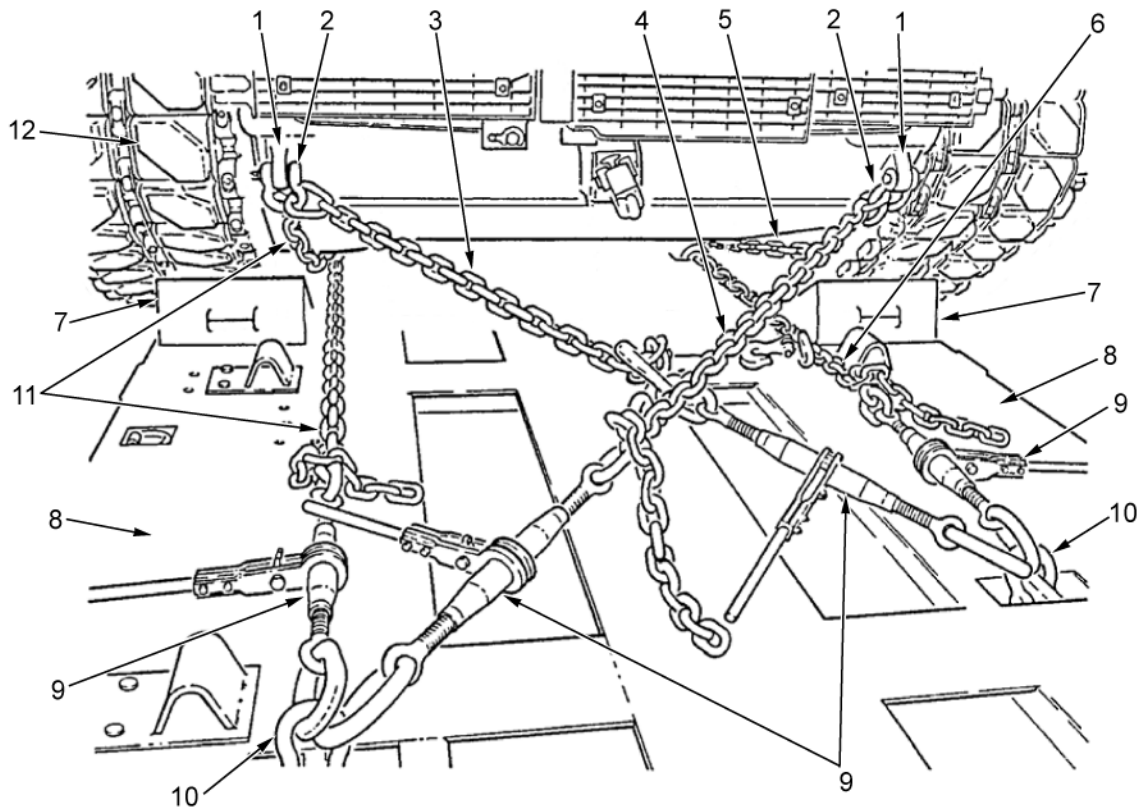
10. Operate two angled load binders (Figure 6, Item 9) to loosen two angle rear payload tiedown chains (Figure 6, Item 3 and Item 4).
11. Disconnect both angle chains (Figure 6, Item 3 and Item 4) from angled load binders (Figure 6, Item 9).
12. Have payload operator release payload brakes (TM 9-2320-360-10).
13. Operate two parallel load binders (Figure 6, Item 9) to tighten both curbside and streetside tiedown chains (Figure 6, Item 11 and Item 5 or Figure 6, Item 11, Item 5, and Item 6).
14. Continue to tighten each load binder (Figure 6, Item 9) as tightly as possible to move payload (Figure 6, Item 12) slightly off of two rear payload chocks (Figure 6, Item 7) or at least reduce pressure applied on rear payload chocks by payload.
15. Have payload operator apply payload brakes (TM 9-2320-360-10).

NOTE

If necessary, use the crowbar to help move two rear payload chocks from under the payload tracks.

16. Move rear payload chocks (Figure 6, Item 7) back approximately 6 in. (15 cm) along both sides of platform (Figure 6, Item 8).
17. Operate two parallel load binders (Figure 6, Item 9) to loosen both curbside and streetside parallel tiedown chains (Figure 6, Item 11 and Item 5, or Figure 6, Item 11, Item 5, and Item 6). Disconnect parallel chains (Figure 6, Item 11 and Item 5, or Figure 6, Item 11, Item 5, and Item 6) from parallel load binders (Figure 6, Item 9).

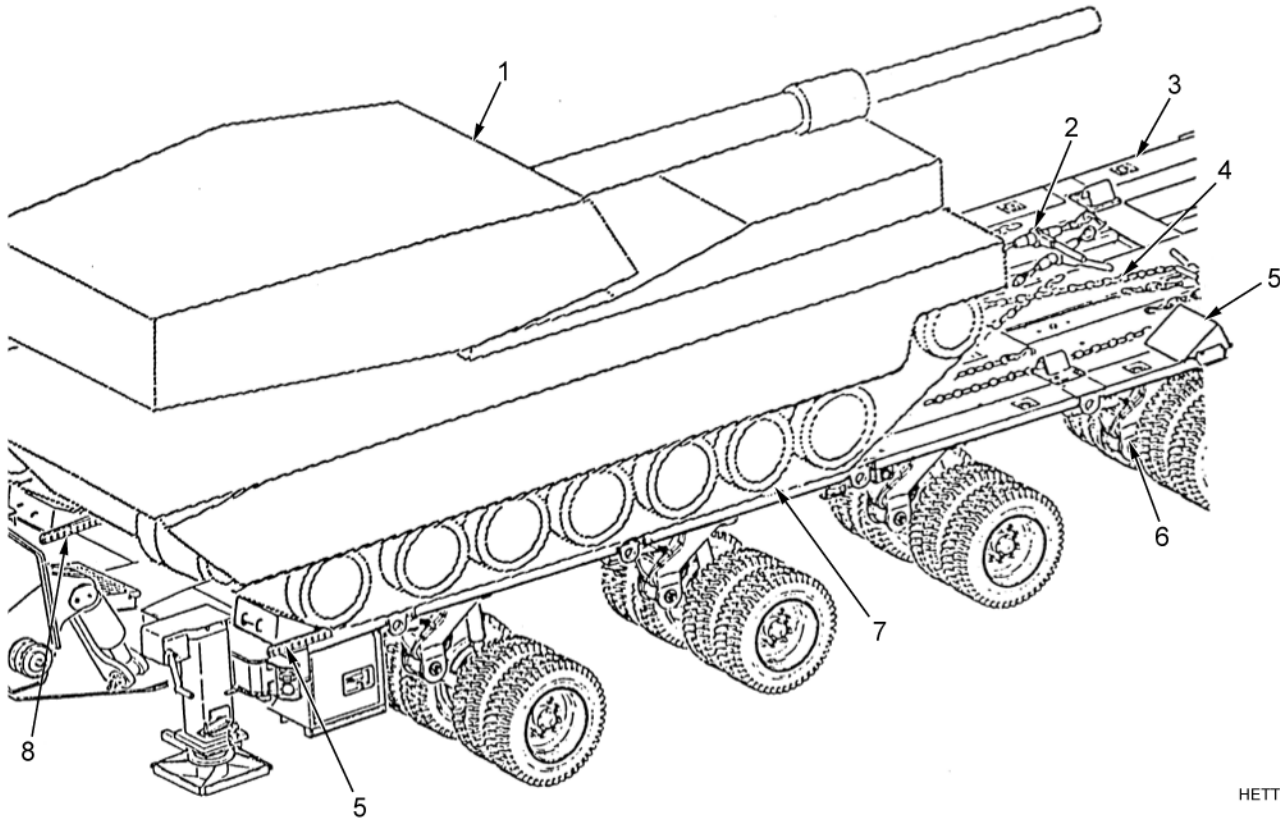
18. Remove four load binders (Figure 6, Item 9) and two shackles (Figure 6, Item 10) from platform (Figure 6, Item 8).
19. Disconnect two chains (Figure 6, Item 11 and Item 3) from streetside shackle (Figure 6, Item 2) on towing lug (Figure 6, Item 1) at rear of payload (Figure 6, Item 8).
20. Disconnect chains (Figure 6, Item 4 and Item 6, or Figure 6, Item 4, Item 6, and Item 5) from curbside shackle (Figure 6, Item 2) on towing lug (Figure 6, Item 1) at rear of payload (Figure 6, Item 8).



HETT0110

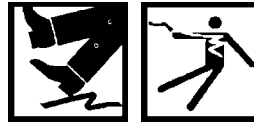
Figure 6. Unloading Able Payloads.

21. Lay chains (Figure 7, Item 4) and load binders (Figure 7, Item 2) toward center of platform (Figure 7, Item 3), between and clear of payload tracks (Figure 7, Item 7), until payload (Figure 7, Item 1) is unloaded.
22. Have payload operator start and warm payload (TM 9-2320-360-10).
23. Move streetside rear payload chock (Figure 7, Item 5) along streetside platform (Figure 7, Item 3) over No. 4 bogie (Figure 7, Item 6). Place curbside rear payload chock (Figure 7, Item 8) near front streetside of platform.



HETT0111

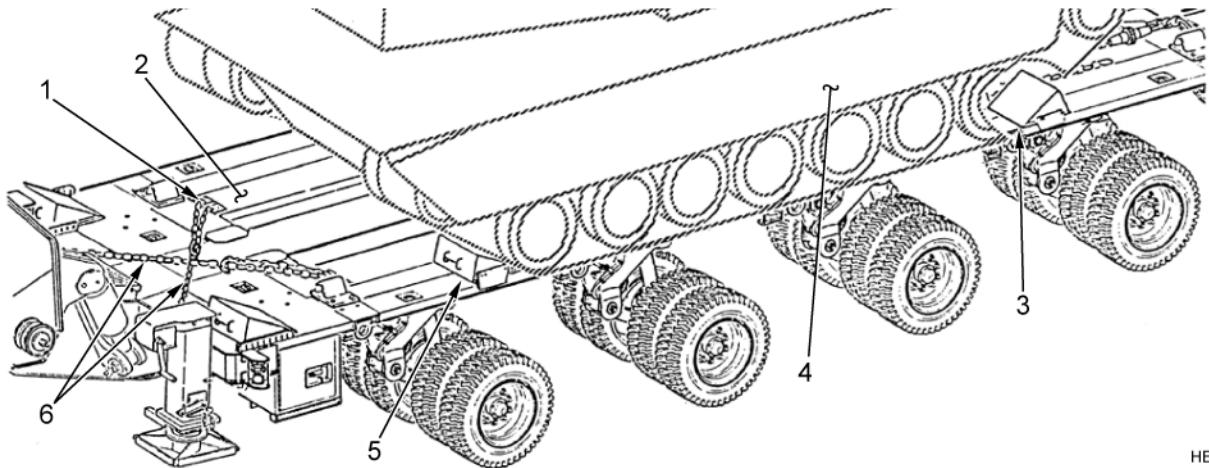
Figure 7. Unloading Able Payloads.

WARNING

- On some semitrailers a solar battery charger is mounted to the top of the gooseneck directly in front of the spare tires.
- Persons working on top of the gooseneck must take **EXTREME** care not to step on the solar battery charger or trip over it.

Failure to follow these warnings may result in injury to personnel or damage to equipment.

24. With assistance of gooseneck/aft spotter, signal payload operator to release payload brakes (TM 9-2320-360-10) and start slowly backing payload (Figure 8, Item 4) until payload contacts rear streetside payload chock (Figure 8, Item 3).
25. Stop payload (Figure 8, Item 4) and apply payload brakes (TM 9-2320-360-10).
26. Place rear curbside payload chock (Figure 8, Item 5) in front of payload (Figure 8, Item 4) on streetside.
27. Remove two tiedown chains (Figure 8, Item 6) from shackles (Figure 8, Item 1) on front of payload (Figure 8, Item 4). Reinstall shackles. Lay two tiedown chains forward toward center of platform (Figure 8, Item 2).
28. With assistance of gooseneck/aft spotter, signal payload operator to start moving payload (Figure 8, Item 4) forward just until rear streetside payload chock (Figure 8, Item 3) can be removed. Apply payload brakes (TM 9-2320-360-10).
29. Perform steps 43 through 49 of Loading Able Payloads (WP 0015) to adjust platform height to platform loading/unloading position, lower ramps, and install two remaining curb guides.



HETT0112

Figure 8. Unloading Able Payloads.

WARNING

- Unnecessary personnel must stand clear of the vehicles, especially behind the payload (engine/turbine exhaust), during unloading operations. At no time during any unloading operations, while the payload is moving, should personnel be on the semitrailer platform.
- The payload operator must drive the payload slowly down the loading ramps and onto the ground.
- Any payload adjustments, side-to-side (turning), must be kept to a minimum.
- On some semitrailers a solar battery charger is mounted to the top of the gooseneck directly in front of the spare tires. Persons working on top of the gooseneck must take **EXTREME** care not to step on the solar battery charger or trip over it.

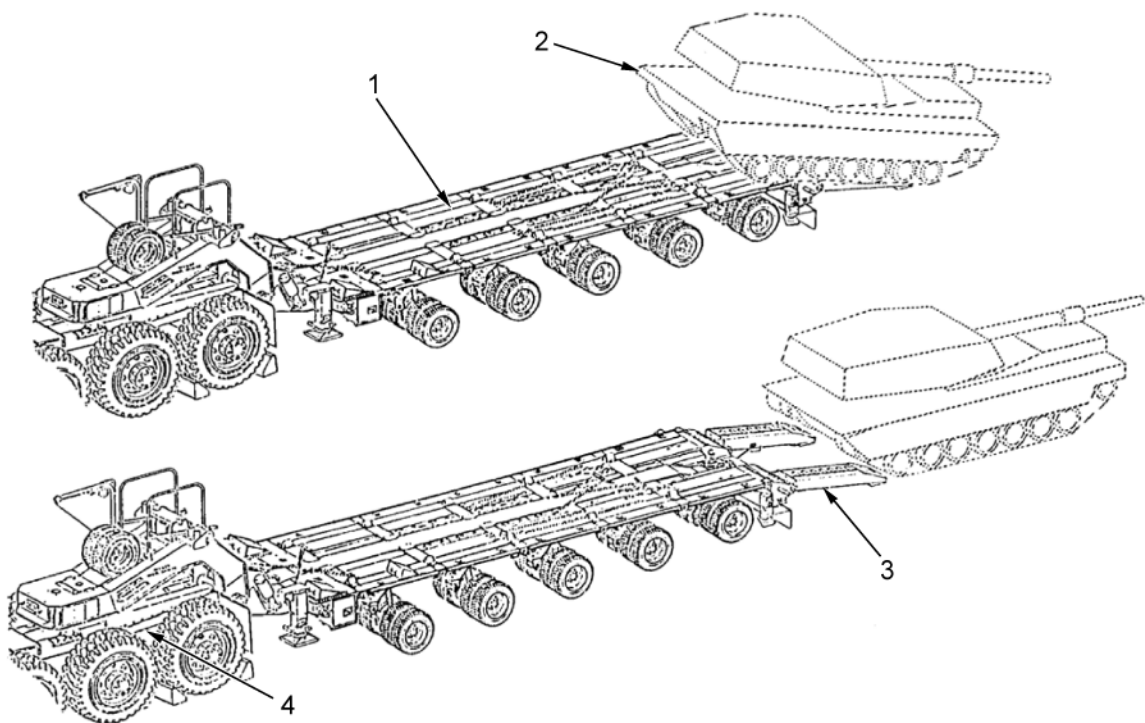
Failure to follow these warnings may result in serious injury to personnel or damage to equipment.

30. With aid of gooseneck/aft spotter, signal payload operator to slowly drive payload (Figure 9, Item 2) off platform (Figure 9, Item 1). Curbside spotter must notify gooseneck/aft spotter of any required payload adjustments while unloading.
31. Have payload operator drive payload (Figure 9, Item 2) back an extra 5 ft (1.5 m) to allow extra clearance for raising and stowing load ramps (Figure 9, Item 3).

WARNING

Failure to set the payload parking brake could allow the payload to roll backward. Failure to follow this warning may result in injury to personnel and damage to equipment.

32. Once payload (Figure 9, Item 2) is on the ground and clear of semitrailer (Figure 9, Item 4), apply payload parking brake (TM 9-2320-360-10). Shut down payload (TM 9-2320-360-10).



HETT0113

Figure 9. Unloading Able Payloads.

NOTE

Remove all the payload and payload chock tiedown chains from the platform and restow all the chains, load binders, and shackles in the platform stowage compartment.

33. Remove capscrew (Figure 10, Item 3) and curb guide stowage bracket (Figure 10, Item 4) from forward recessed area on platform (Figure 10, Item 1).
34. Remove all 12 curb guides (Figure 10, Item 2) from loading positions on platform (Figure 10, Item 1) and place in center of platform for storage (ten curb guides located forward, two curb guides located aft).
35. Secure ten curb guides (Figure 10, Item 2), located forward, by installing two curb guide stowage brackets (Figure 10, Item 4) and capscrews (Figure 10, Item 3).
36. Remove curb guide stowage bracket (Figure 10, Item 6) and capscrew (Figure 10, Item 5) from platform storage compartment (Figure 10, Item 7).
37. Secure two curb guides (Figure 10, Item 2), located aft, by installing curb guide stowage bracket (Figure 10, Item 6) and capscrew (Figure 10, Item 5).

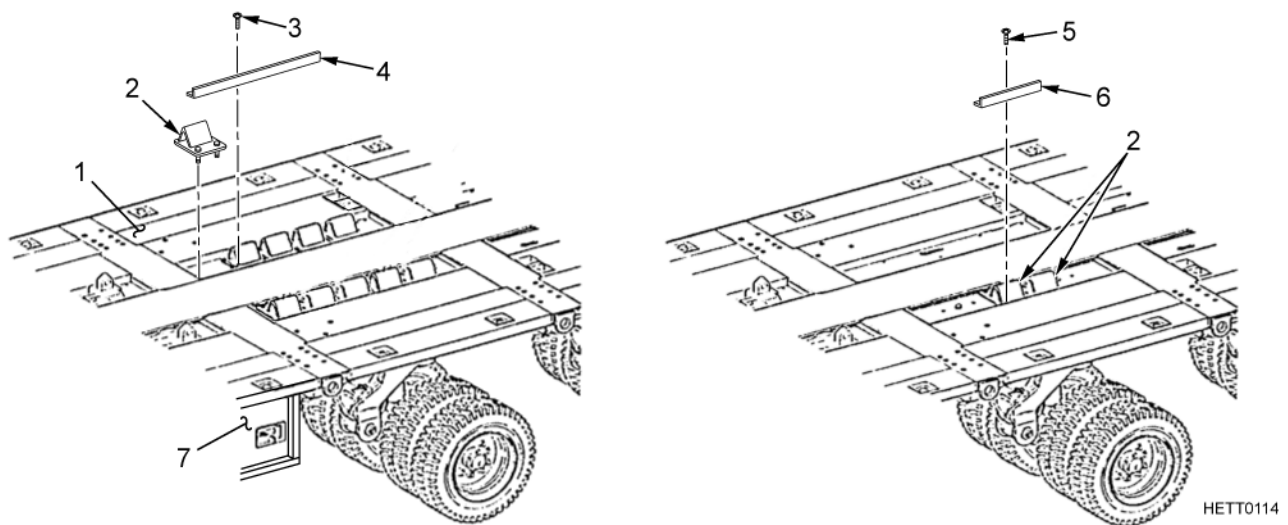


Figure 10. Unloading Able Payloads.

38. Remove two capscrews (Figure 11, Item 3), washers (Figure 11, Item 2), and two sheets (Figure 11, Item 4) from each of two rear payload chocks (Figure 11, Item 1).

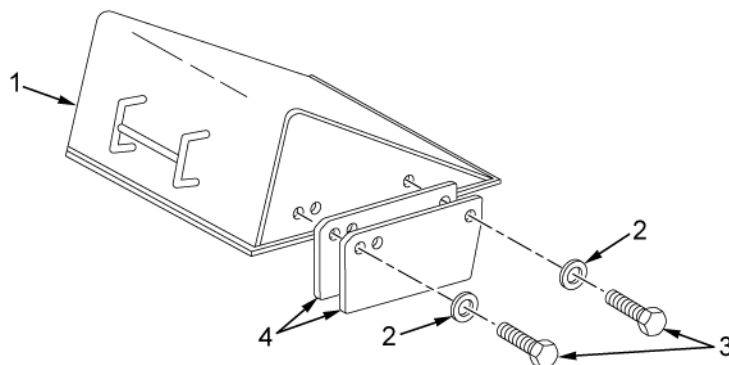


Figure 11. Unloading Able Payloads.

39. Position two rear payload chocks (Figure 12, Item 6) on top of two front payload chocks (Figure 12, Item 3 and Item 2). Install four sheets (Figure 12, Item 7), ten capscrews (Figure 12, Item 4), and washers (Figure 12, Item 5).
40. Perform steps 61 through 64 of Loading Able Payloads (WP 0015) and adjust platform to normal running height.
41. Move suspension shutoff lever (Figure 12, Item 1) to RUN position.
42. Raise rear support legs (WP 0012).
43. Adjust ramp span width inward (furthest inward position) and stow loading ramps for transport as required (WP 0009).
44. Shut down Auxiliary Power Unit (APU) (WP 0005).

NOTE

Stow the crowbar at the back of the platform and secure the crowbar in place with a hitch pin. Restow all the tools and equipment used during this procedure in the platform stowage compartment.

45. If tractor/semitrailer is not going to remain parked at this time, restow tractor wheel chocks (TM 9-2320-360-10).

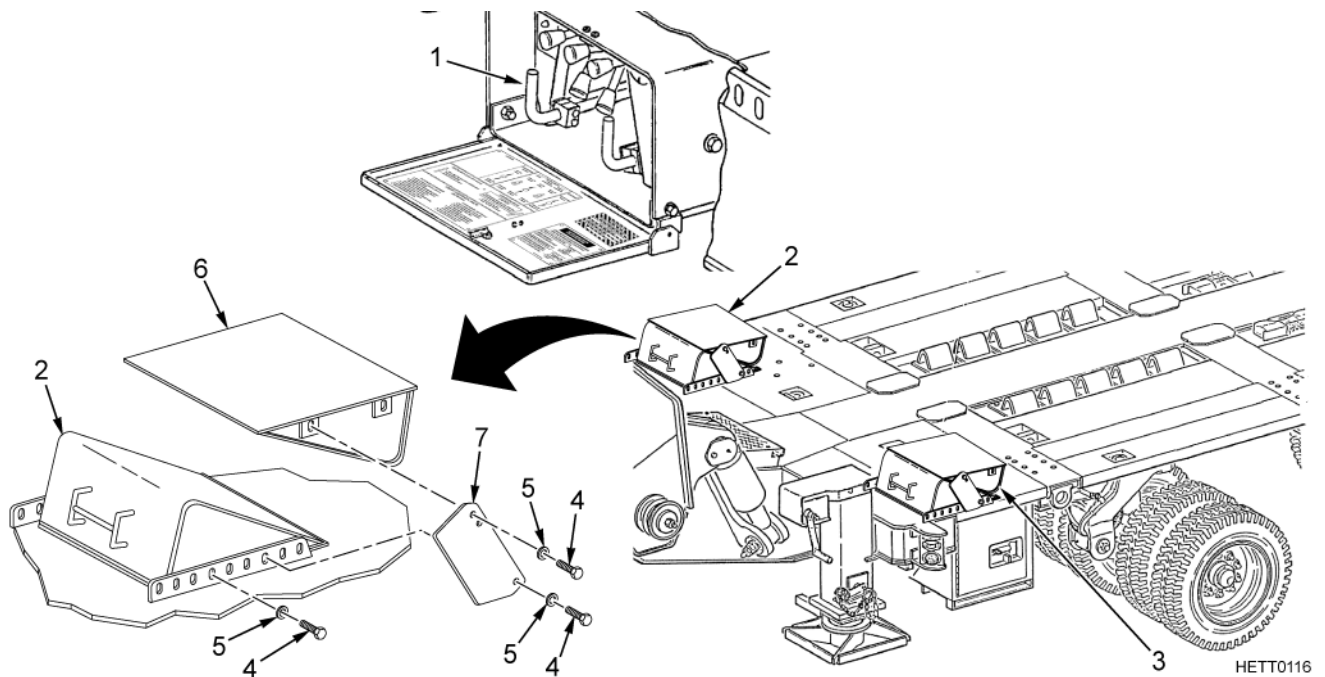


Figure 12. Unloading Able Payloads.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**OPERATION UNDER USUAL CONDITIONS - DUAL WINCH LOADING**

INITIAL SETUP:**Personnel Required**

2

WP 0015

WP 0169

TB 43-0142

References

WP 0009

TM 9-2320-270-10

WP 0013

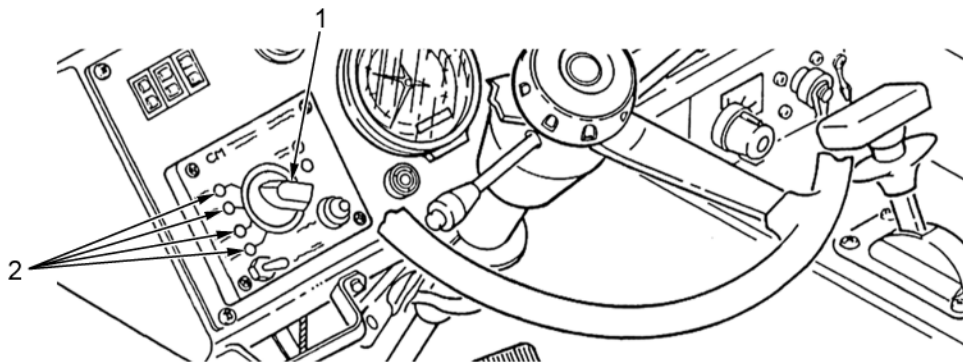
TM 9-2320-360-10

GENERAL INFORMATION

This work package contains instructions for loading a disabled payload (M1 Series Main Battle Tank) onto the Heavy Equipment Transporter (HET) M1000 semitrailer coupled to a U.S. Army M1070 or M911 tractor.

DUAL WINCH LOADING**NOTE**

- The M1070 tractor is illustrated as the prime mover throughout these instructions; however, unique instructions for either the M1070 or the M911 tractor will be identified where applicable.
 - The prime difference between the M1070 and M911 tractor is that the M1070 tractor has an auxiliary winch system that is used to pull the main cables to the rear of the semitrailer for attachment to the payload. The operation of the M1070 winch controls is described herein.
 - Refer to the M911 Operating Instructions (TM 9-2320-270-10) for location, description, and operation of winch controls.
1. Start tractor (TM 9-2320-360-10).
 2. On M1070 tractor, set central tire insulation system (CTIS) switch (Figure 1, Item 1) to setting for expected road or terrain conditions and allow tractor to sit until selected CTIS indicator (Figure 1, Item 2) remains lit for that CTIS setting.



HETT0117

Figure 1. Dual Winch Loading.

3. If not already coupled, couple tractor to semitrailer (WP 0013).
4. Align back of tractor/semitrailer combination as close as possible to payload, approximately 15 ft (4.6 m) on the ground as level as possible.

WARNING

Whenever possible, load semitrailer on level ground. In adverse conditions, loading can be done on grades up to 10 percent. Failure to follow this warning may result in injury to personnel.

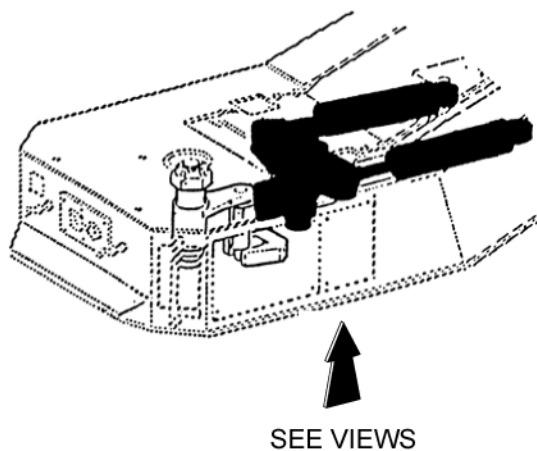
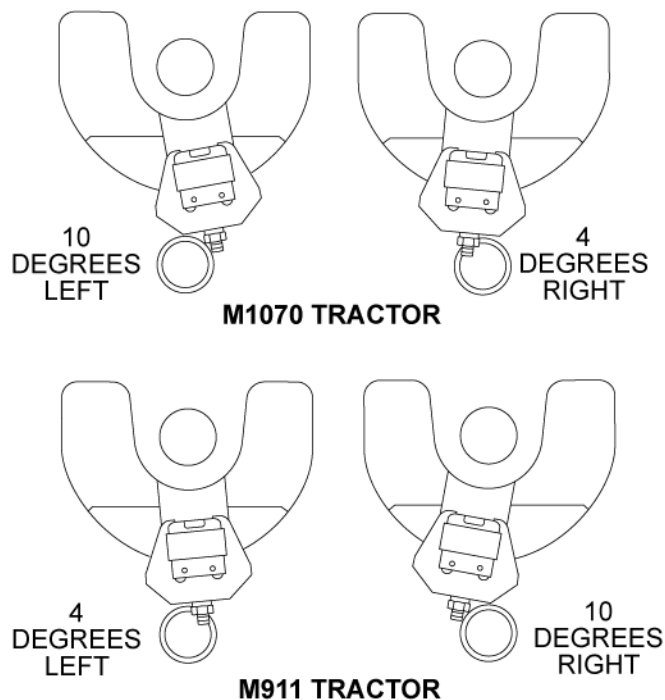
WARNING

Due to the possibility of winch cables piling up against the end flanges of the cable drums, the following offset limits between the tractor and semitrailer (Figure 2) must be adhered to:

- M1070 tractor: 10 degrees left and 4 degrees right.
- M911 tractor: 4 degrees left and 10 degrees right.

Failure to follow these warnings may result in injury to personnel.

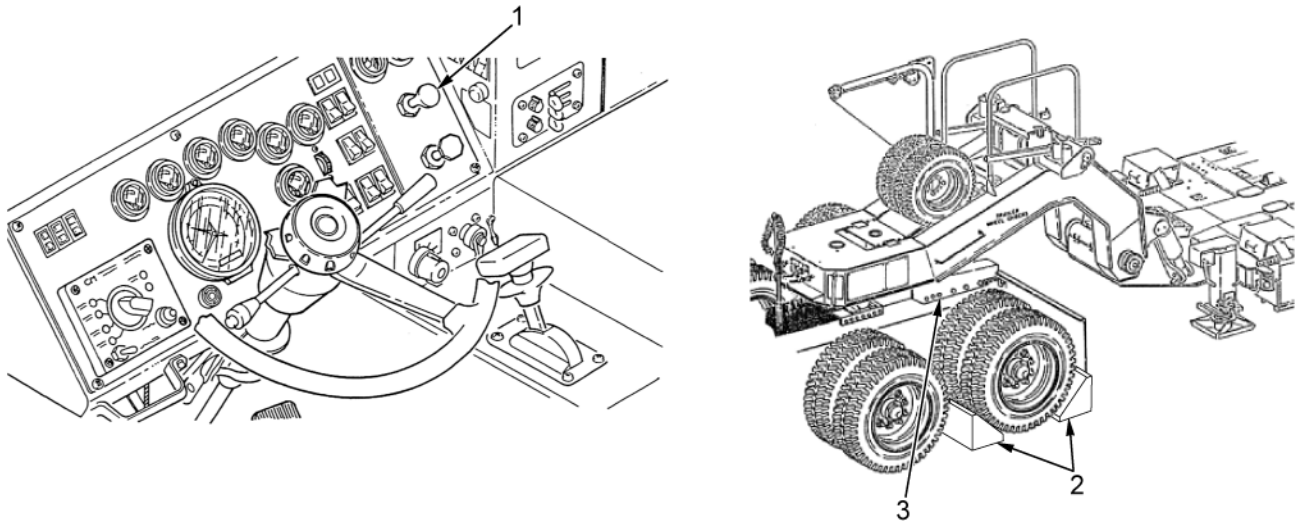
5. Visually check tractor/semitrailer offset angle. Make any required adjustments to tractor by having spotter check relationship between steering wedge bolt and weld circle at bottom rear of pickup plate. If inside edge of bolt aligns with outside edge of weld circle, offset angle is 10 degrees. Make any required adjustments to tractor.



HETT0118

Figure 2. Dual Winch Loading.

6. Apply tractor parking brakes by pulling out parking brake valve (Figure 3, Item 1). Remove four wheel chocks (Figure 3, Item 2) from stowage compartment on tractor (Figure 3, Item 3) and chock wheels on both sides of tractor.



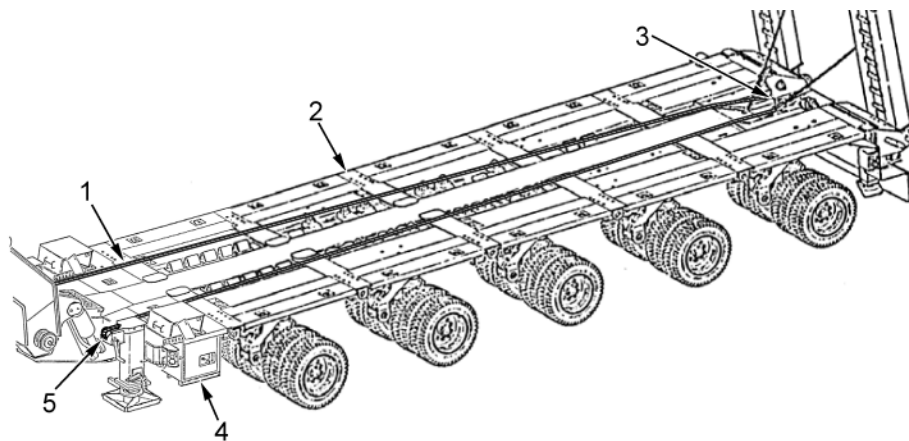
HETT0119

Figure 3. Dual Winch Loading.

NOTE

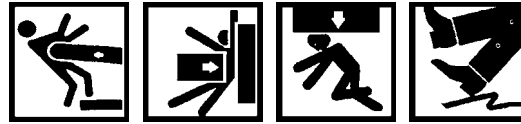
A manila rope will be used to pull the tractor winch cable through the snatch block for use during unloading procedures.

7. Remove manila rope (Figure 4, Item 1) from platform stowage compartment (Figure 4, Item 4). Starting from front streetside corner of platform (Figure 4, Item 2), pull one end of manila rope back and through snatch block (Figure 4, Item 3) and forward to front curbside corner of platform.
8. Tie both ends of manila rope (Figure 4, Item 1) to front lifting eyes (Figure 4, Item 5) on platform (Figure 4, Item 2) (just inward of each front support leg).
9. Position payload chocks, curb guides, and tiedown chains. Adjust platform to loading position. Lower ramps by performing steps 8 through 51 of Loading Able Payloads (WP 0015).



HETT0120

Figure 4. Dual Winch Loading.

WARNING

- If possible, provide ample clear space behind the disabled payload during loading to protect personnel and prevent damage to equipment should cables break while payload is being loaded.
- Ensure winch cables are not kinked, clevises are secure to winch cables, and snatch blocks and shackles are in good condition and properly secured.
- Ensure winch cables are inspected in accordance with TB 43-0142.
- Use extreme caution during any operation on a slope.
- Have a ground spotter stand off curbside of semitrailer and maintain visual contact with the winch operator. The spotter must observe cables, snatch blocks, shackles, and payload position during loading.
- **DO NOT** overload tractor winches. Know the rating of the winches being used and any protection devices (such as shear pins) or injury to personnel may result.

Failure to follow these warnings may result in serious injury to personnel.

WARNING

- All ground personnel must stand clear of winch cables except when handling.
- During winch-on operations on a downgrade, the payload must be restrained from the rear with some other vehicle to prevent possible loss of control of the payload.
- At no time during loading operations, while the payload is being pulled on with winches, should personnel be on the semitrailer platform.
- Always wear leather gloves when handling cable. Never allow cable to run through hands.

Failure to follow these warnings may result in injury to personnel.

NOTE

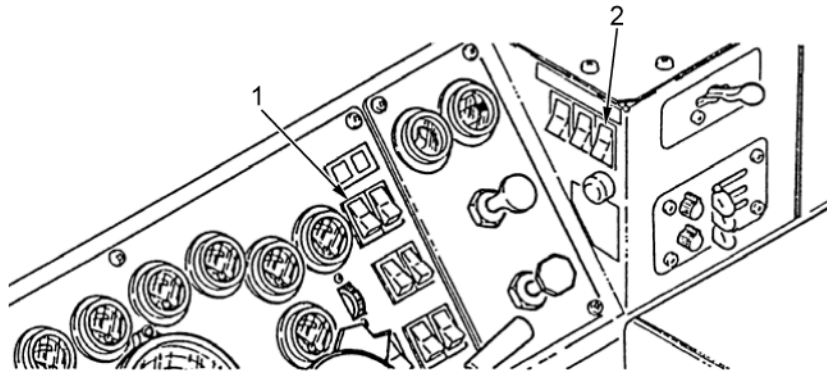
- The M1070 tractor has an auxiliary winch system that is used to pay out the main winch cables to the payload.
- When using the M911 tractor, the main winch cables must be payed out manually.

10. When using an M911 tractor, proceed to step 58.

NOTE

- Ensure that M1070 tractor parking brake is applied. PTO will not engage unless tractor parking brake is set.
- Perform steps 11 through 52 to use the auxiliary winch to pay out main cables for the M1070 tractor.

11. Turn beacon light switch (Figure 5, Item 1) to ON position. With engine idling, set PTO switch (Figure 5, Item 2) to ON.



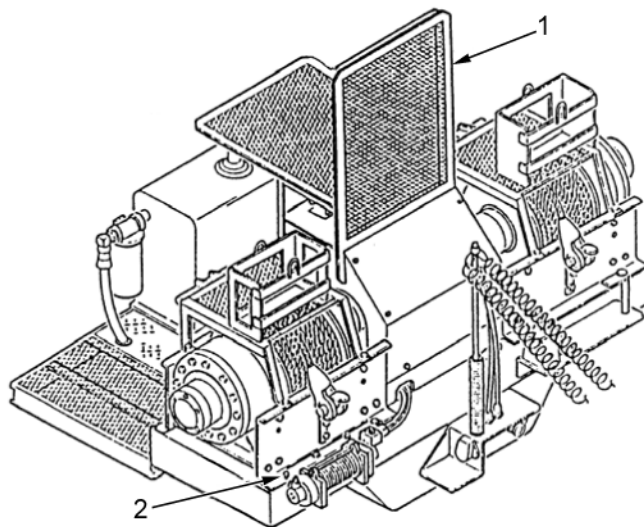
HETT0121

Figure 5. Dual Winch Loading.

WARNING

Hearing protection must be worn when near winching station or when operating winches. Failure to follow this warning may result in injury to personnel.

12. Raise guard (Figure 6, Item 1). Lock guard in upright position and release AUXILIARY WINCH KICKOUT by lifting and rotating lever (Figure 6, Item 2) counterclockwise.



HETT0122

Figure 6. Dual Winch Loading.

13. Remove two large shackles (Figure 7, Item 4) from rear payload tiedown ring (Figure 7, Item 3) and four load binders (Figure 7, Item 2). Leave load binders and chains (Figure 7, Item 5) in place on platform (Figure 7, Item 1).

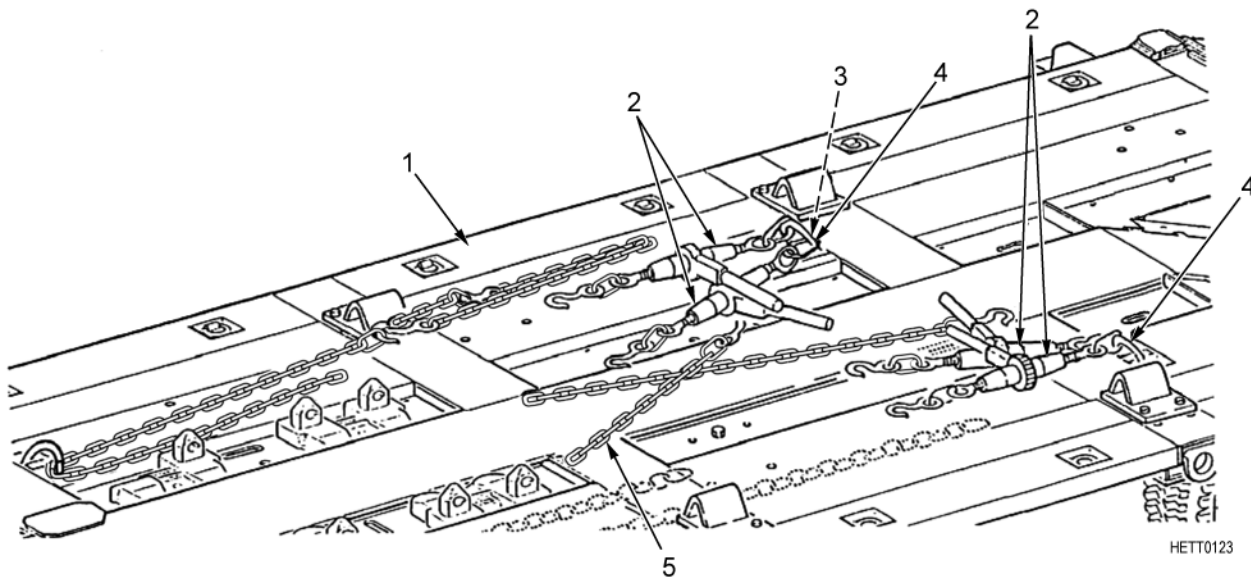


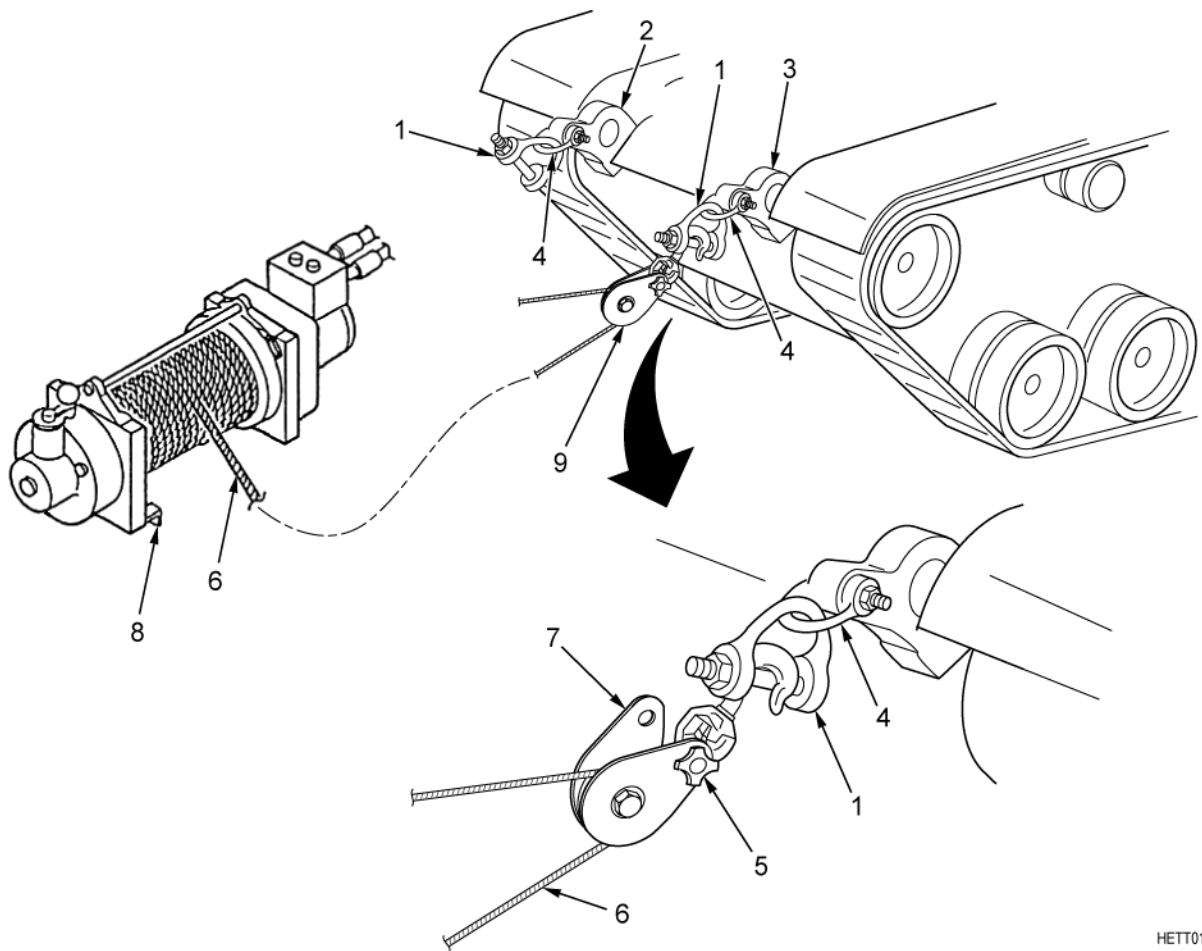
Figure 7. Dual Winch Loading.

14. Remove two smaller shackles (Figure 8, Item 1) from Basic Issue Items (BII) (WP 0169). Unhook auxiliary winch cable (Figure 8, Item 6) from stow hook (Figure 8, Item 8).

NOTE

Pull auxiliary winch cable along streetside of gooseneck and over platform to front of payload.

15. Install two large shackles (Figure 8, Item 4) (from platform) and two smaller shackles (Figure 8, Item 1) (from BII, WP 0169) on upper left recovery eye (Figure 8, Item 3) and upper right recovery eye (Figure 8, Item 2).
16. Remove auxiliary snatch block (Figure 8, Item 9) from stowage on M1070 tractor (TM 9-2320-360-10). Attach auxiliary snatch block to smaller shackle (Figure 8, Item 1) on upper left recovery eye (Figure 8, Item 3) of payload.
17. Unscrew retainer bolt (Figure 8, Item 5), rotate side housing (Figure 8, Item 7) to open auxiliary snatch block (Figure 8, Item 9), pass auxiliary winch cable (Figure 8, Item 6) through auxiliary snatch block, and rotate side housing to close. Tighten retainer bolt to secure side housing in closed position.



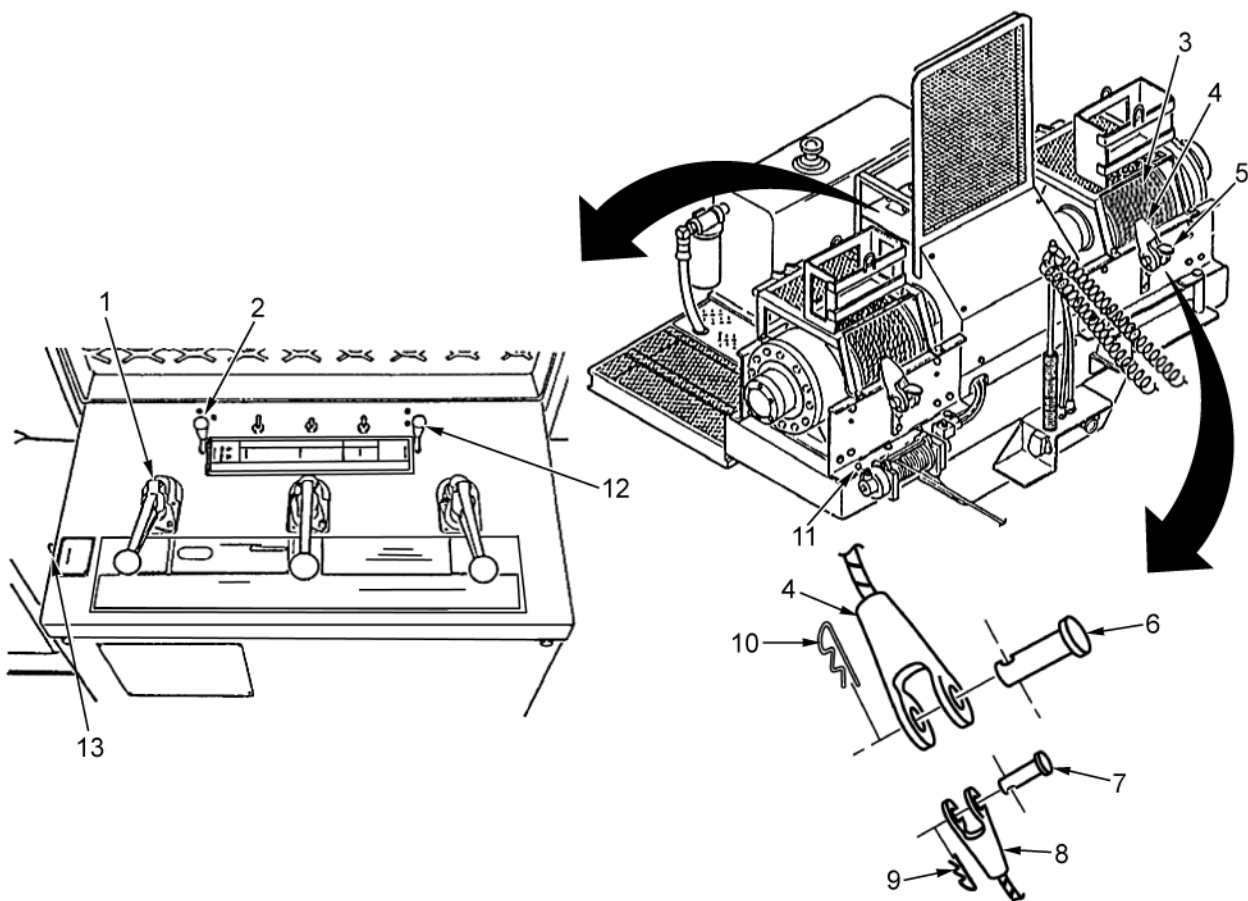
HETT0124

Figure 8. Dual Winch Loading.

NOTE

Ensure auxiliary winch cable is pulled forward over platform and along curbside of gooseneck toward passenger side of winching station on tractor.

18. Engage both DRIVER SIDE WINCH KICKOUT (Figure 9, Item 12) and PASSENGER SIDE WINCH KICKOUT (Figure 9, Item 2) switches by pushing on each switch.
19. Push CABLE HOLD-DOWN lever (Figure 9, Item 13) to ON position.
20. Pull PASSENGER SIDE WINCH lever (Figure 9, Item 1) upward momentarily until there is enough slack in passenger side winch cable (Figure 9, Item 3) to be removed from stow hook (Figure 9, Item 5). Move winch cable clevis (Figure 9, Item 4) off of stow hook to unstow winch cable. Continue paying out winch cable until spotter on the ground can reach winch cable clevis. Release PASSENGER SIDE WINCH lever.
21. Remove and retain cotter pin (Figure 9, Item 10) and shouldered pin (Figure 9, Item 6) from passenger side winch cable clevis (Figure 9, Item 4).
22. Remove cotter pin (Figure 9, Item 9) and shouldered pin (Figure 9, Item 7) from auxiliary winch cable clevis (Figure 9, Item 8). Install auxiliary winch cable clevis over one ear of passenger side winch cable clevis (Figure 9, Item 4) and install shouldered pin and cotter pin.
23. Engage AUXILIARY WINCH KICKOUT lever (Figure 9, Item 11) by lifting and rotating lever clockwise. Disengage PASSENGER SIDE WINCH KICKOUT (Figure 9, Item 2) switch by pulling switch.



HETT0125

Figure 9. Dual Winch Loading.

WARNING

DO NOT allow auxiliary winch cable to cross itself or knot up on winch. Failure to follow this warning may result in injury to personnel.

NOTE

With the aid of an assistant, use one person to operate winch controls and a second person to ensure that winch cable clevises **DO NOT** hang up on the platform.

24. Push down on **AUXILIARY WINCH** lever (Figure 10, Item 1) to pull passenger side winch cable (Figure 10, Item 3) toward auxiliary snatch block (Figure 10, Item 2).

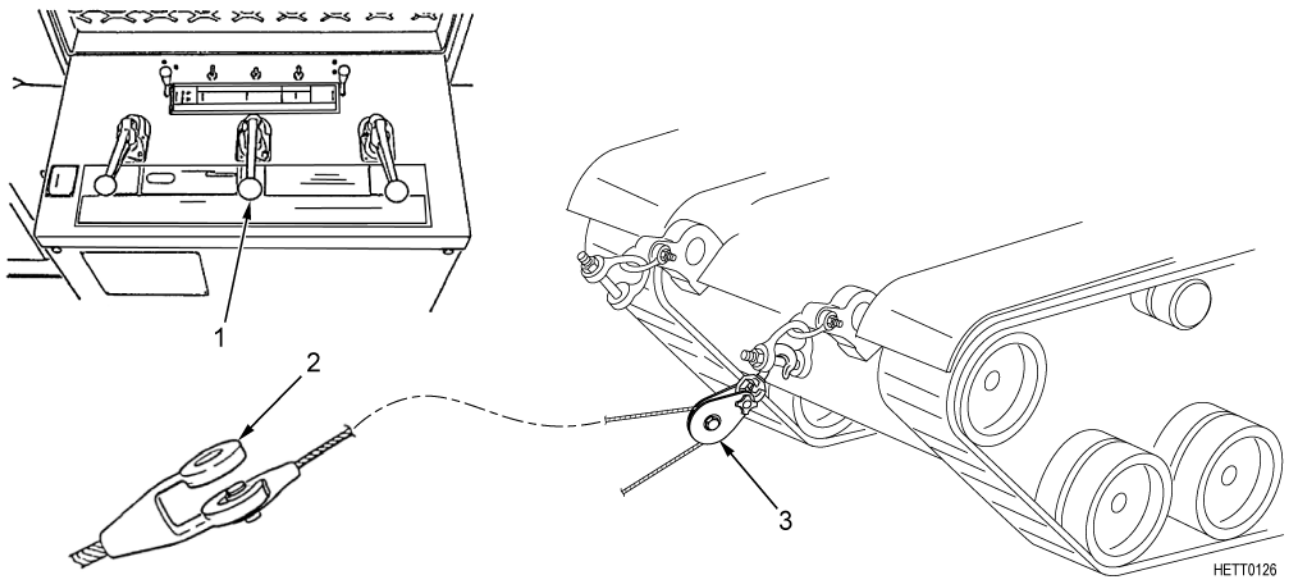
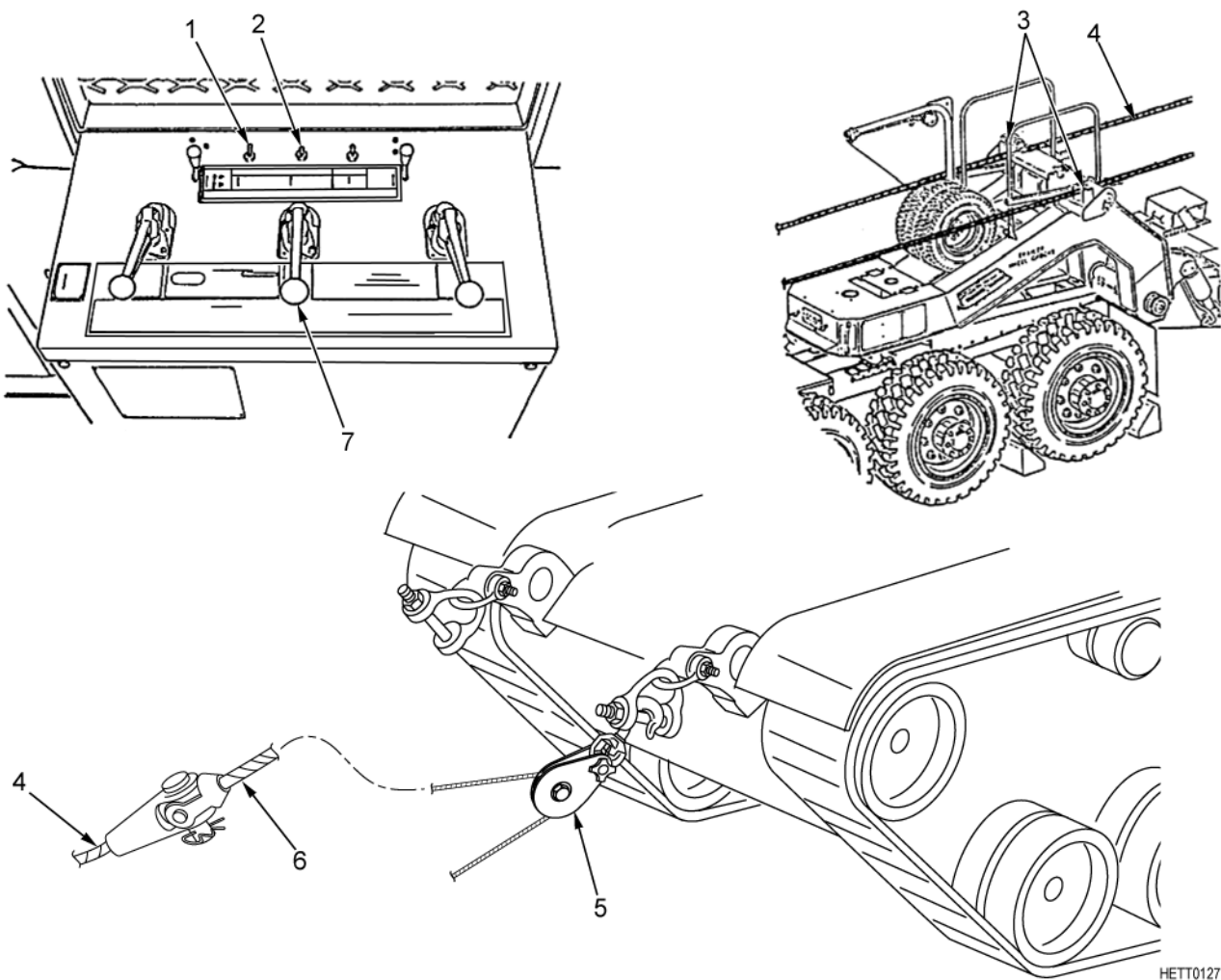


Figure 10. Dual Winch Loading.

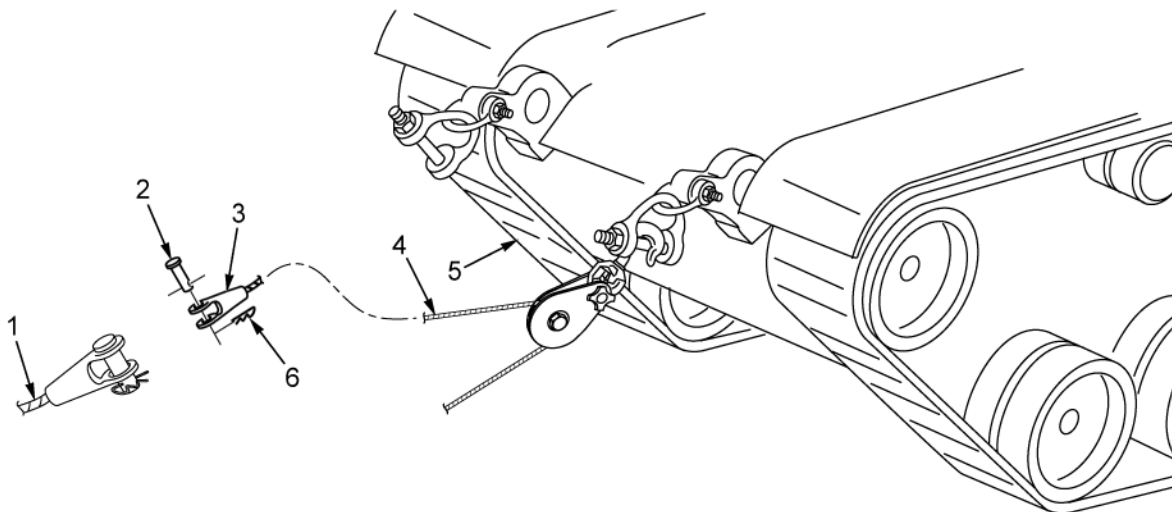
25. If auxiliary winch cable (Figure 11, Item 6) does not pull passenger side winch cable (Figure 11, Item 4), push engine SPEED CONTROL switch (Figure 11, Item 1) to HIGH engine IDLE.
26. Momentarily push engine SPEED CONTROL switch (Figure 11, Item 2) to lock engine speed at high idle (approximately 1,500 rpm), and then release switch.
27. When passenger side winch cable (Figure 11, Item 4) reaches front of platform, release AUXILIARY WINCH lever (Figure 11, Item 7).
28. Route passenger side winch cable (Figure 11, Item 4) through gooseneck cable guide (Figure 11, Item 3).
29. Push down on AUXILIARY WINCH lever (Figure 11, Item 7) and continue to pull passenger winch cable (Figure 11, Item 4) to auxiliary snatch block (Figure 11, Item 5).
30. Release AUXILIARY WINCH lever (Figure 11, Item 7) when passenger side winch cable (Figure 11, Item 4) is approximately 12 in. (29 cm) from auxiliary snatch block (Figure 11, Item 5). Spotter must continue to pull passenger side winch cable until winch cable has enough slack that it touches the ground.



HETT0127

Figure 11. Dual Winch Loading.

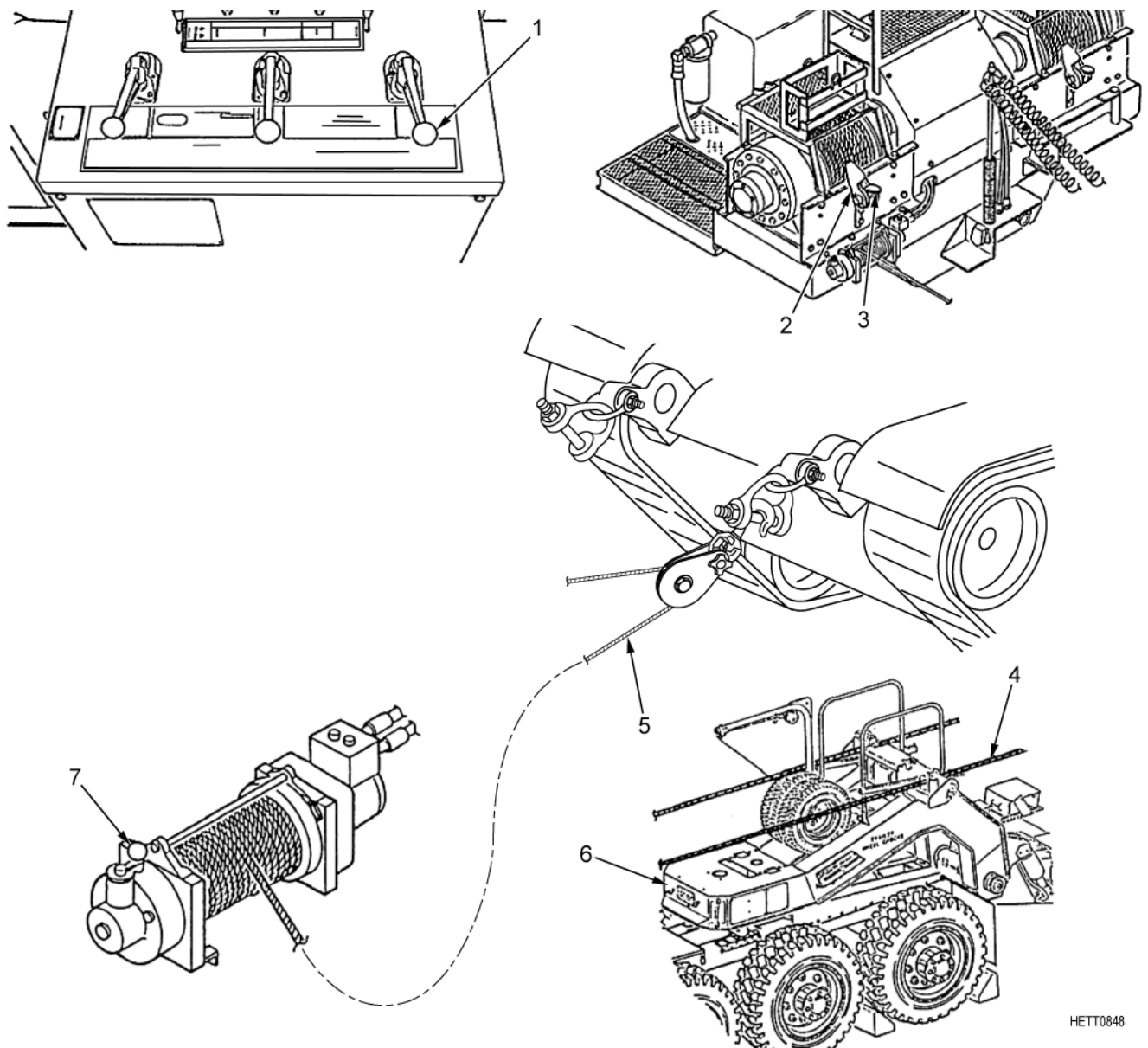
31. Remove cotter pin (Figure 12, Item 6) and shouldered pin (Figure 12, Item 2) from auxiliary winch cable clevis (Figure 12, Item 3).
32. Separate auxiliary winch cable (Figure 12, Item 4) from passenger side winch cable (Figure 12, Item 1).
33. Lay passenger side winch cable (Figure 12, Item 1) on the ground in front of payload (Figure 12, Item 5).



HETT0847

Figure 12. Dual Winch Loading.

34. Release AUXILIARY WINCH KICKOUT by lifting and rotating lever (Figure 13, Item 7) counterclockwise.
35. Pull auxiliary winch cable (Figure 13, Item 5) forward over platform and along streetside of gooseneck (Figure 13, Item 6) toward driver side of winching station on tractor.
36. Pull DRIVER SIDE WINCH lever (Figure 13, Item 1) upward momentarily until there is enough slack in driver side winch cable (Figure 13, Item 4) to be removed from stow hook (Figure 13, Item 3).
37. Move driver's side winch cable clevis (Figure 13, Item 2) off of stow hook (Figure 13, Item 3) to unstow winch cable (Figure 13, Item 4).
38. Continue paying out cable (Figure 13, Item 4) until spotter on the ground can reach clevis (Figure 13, Item 2). Release lever (Figure 13, Item 1).



HETT0848

Figure 13. Dual Winch Loading.

39. Remove and retain cotter pin (Figure 14, Item 7) and shouldered pin (Figure 14, Item 10) from driver side winch cable clevis (Figure 14, Item 9).
40. Install auxiliary winch cable clevis (Figure 14, Item 13) over one ear of clevis (Figure 14, Item 9) of driver side winch cable (Figure 14, Item 8) and install shouldered pin (Figure 14, Item 11) and cotter pin (Figure 14, Item 14).
41. Engage AUXILIARY WINCH KICKOUT by lifting and rotating lever (Figure 14, Item 6) clockwise. Disengage DRIVER SIDE WINCH KICKOUT switch (Figure 14, Item 3) by pulling switch.

WARNING

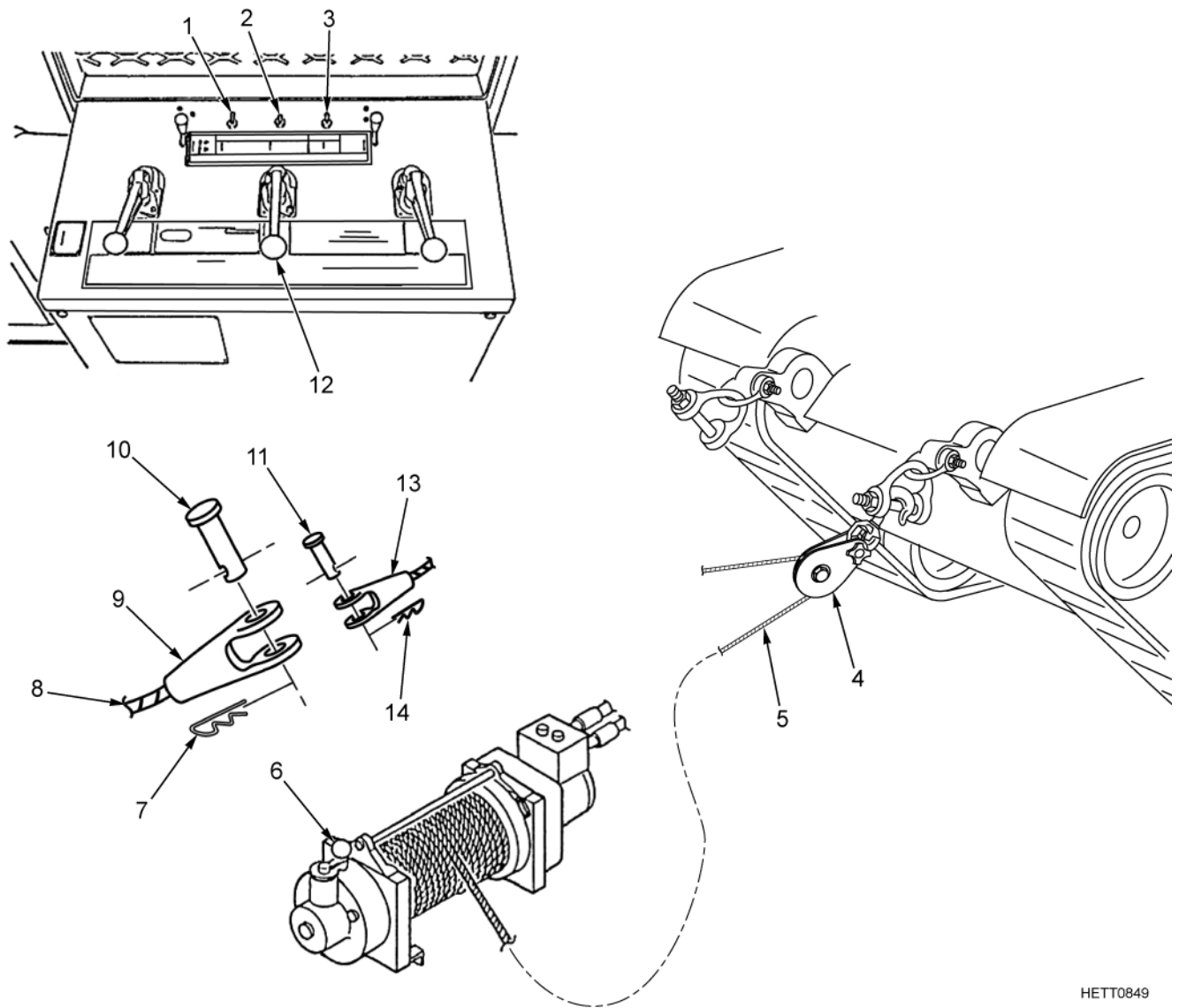


DO NOT allow auxiliary winch cable to cross itself or knot up on winch. Failure to follow this warning may result in injury to personnel.

NOTE

With the aid of an assistant, use one person to operate the winch controls and a second person to ensure that winch cable clevises DO NOT hang up on platform.

42. Push down on AUXILIARY WINCH lever (Figure 14, Item 12) to pull driver side winch cable (Figure 14, Item 8) to auxiliary snatch block (Figure 14, Item 4).
43. If auxiliary winch cable (Figure 14, Item 5) does not pull driver side winch cable (Figure 14, Item 8), push engine SPEED CONTROL switch (Figure 14, Item 1) to HIGH engine IDLE. Momentarily push engine SPEED CONTROL switch (Figure 14, Item 2) to lock engine speed at high idle (approximately 1,500 rpm), and then release switch.



HETT0849

Figure 14. Dual Winch Loading.

44. When driver side winch cable (Figure 15, Item 3) reaches front of platform, release AUXILIARY WINCH lever (Figure 15, Item 1).
45. Route driver side winch cable (Figure 15, Item 3) through gooseneck cable guide (Figure 15, Item 2).
46. Push down on AUXILIARY WINCH lever (Figure 15, Item 1) and continue to pull driver side winch cable (Figure 15, Item 3) to auxiliary snatch block (Figure 15, Item 4).
47. Release AUXILIARY WINCH lever (Figure 15, Item 1) when driver side winch cable (Figure 15, Item 3) is approximately 12 in. (30 cm) from auxiliary snatch block (Figure 15, Item 4).
48. Spotter must continue to pull driver side winch cable (Figure 15, Item 3) until winch cable has enough slack that it touches the ground.
49. Remove cotter pin (Figure 15, Item 5) and shouldered pin (Figure 15, Item 7) from auxiliary winch cable clevis (Figure 15, Item 6).
50. Separate auxiliary winch cable (Figure 15, Item 9) from driver side winch cable (Figure 15, Item 3).
51. Lay driver side winch cable (Figure 15, Item 3) on the ground in front of payload (Figure 15, Item 8).
52. Install shouldered pin (Figure 15, Item 7) and cotter pin (Figure 15, Item 5) in auxiliary winch cable clevis (Figure 15, Item 6).

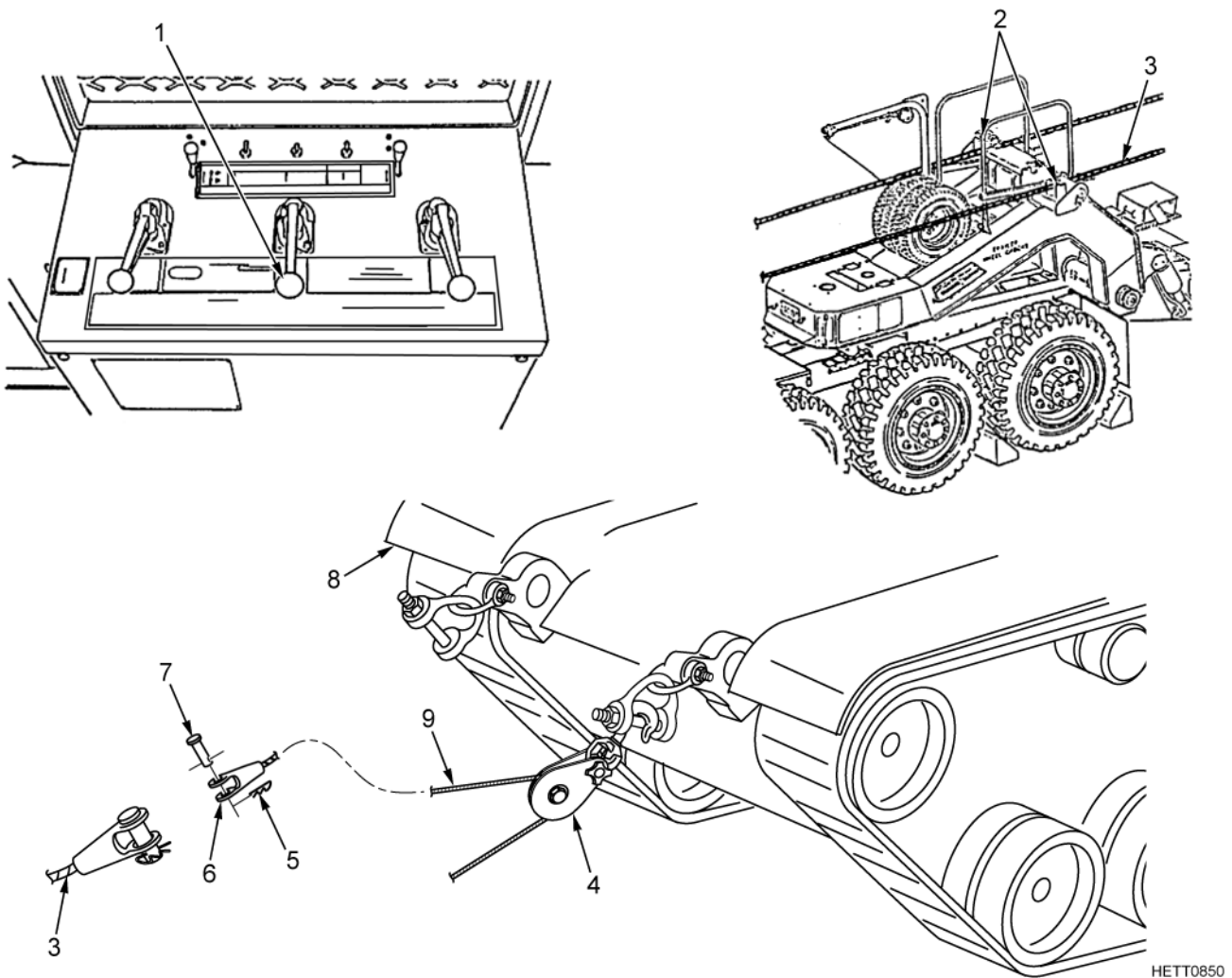
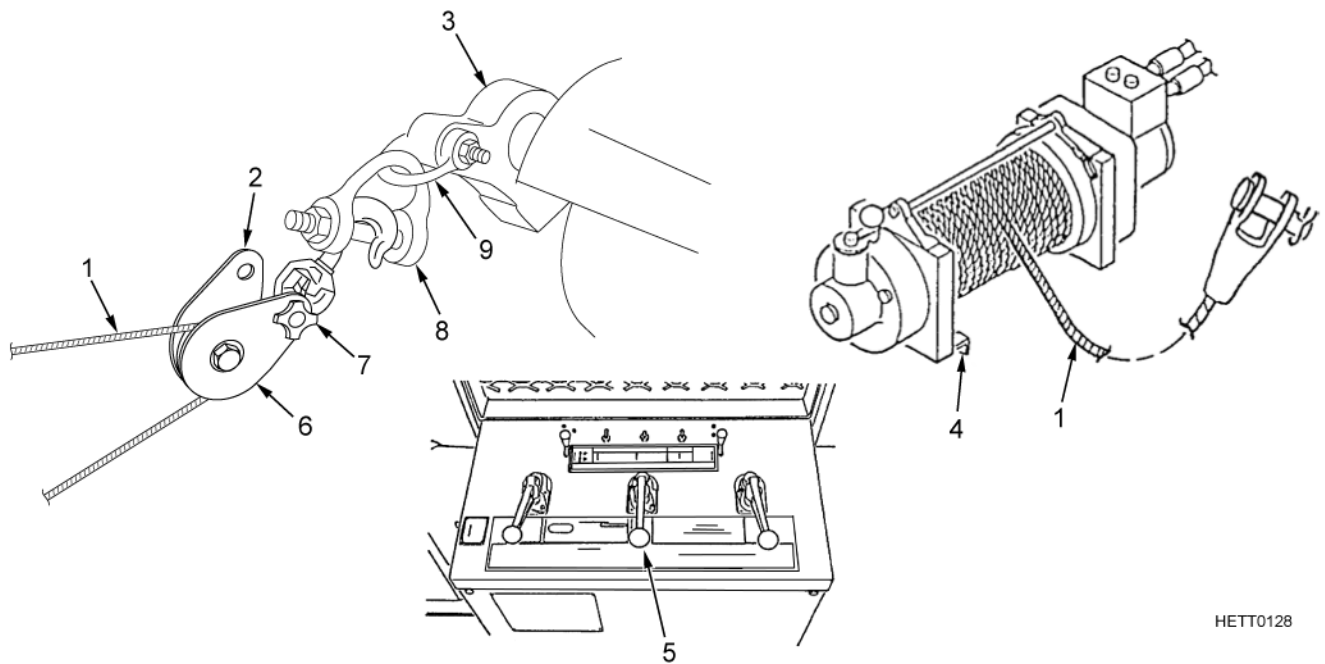


Figure 15. Dual Winch Loading.

NOTE

Perform steps 53 through 57 to stow snatch block and auxiliary winch cable.

53. Unscrew retainer bolt (Figure 16, Item 7) and rotate side housing (Figure 16, Item 2) on auxiliary snatch block (Figure 16, Item 6) to open snatch block.
54. Remove auxiliary winch cable (Figure 16, Item 1) from auxiliary snatch block (Figure 16, Item 6), rotate side housing (Figure 16, Item 2) to close, and tighten retainer bolt (Figure 16, Item 7) to secure side housing in closed position.
55. Remove auxiliary snatch block (Figure 16, Item 6) from shackle (Figure 16, Item 8) and place back in storage on M1070 tractor.
56. Remove two small shackles (Figure 16, Item 8) from larger shackles (Figure 16, Item 9) in upper left and right recovery eyes (Figure 16, Item 3). Return two small shackles to BII (WP 0169).
57. Using one person to push downward on AUXILIARY WINCH lever (Figure 16, Item 5) and one person to maintain tension on auxiliary winch cable (Figure 16, Item 1), retract winch cable and restow cable on stow hook (Figure 16, Item 4).



HETT0128

Figure 16. Dual Winch Loading.

NOTE

- When using M1070 tractor, proceed to step 60 below.
- When using M911 tractor, perform steps 58 through 59 to pay out main winch cables to payload.

58. Unhook passenger side winch cable clevis (Figure 17, Item 8) and driver side winch cable clevis (Figure 17, Item 6) from stowage points on tractor. Ensure clevises are secure on cables (Figure 17, Item 9 and Item 10).

NOTE

Winch operator must pay out one cable at a time while spotter supports cable end and guides cable toward back of semitrailer until each cable is at least 4 ft (1.2 m) past front of payload.

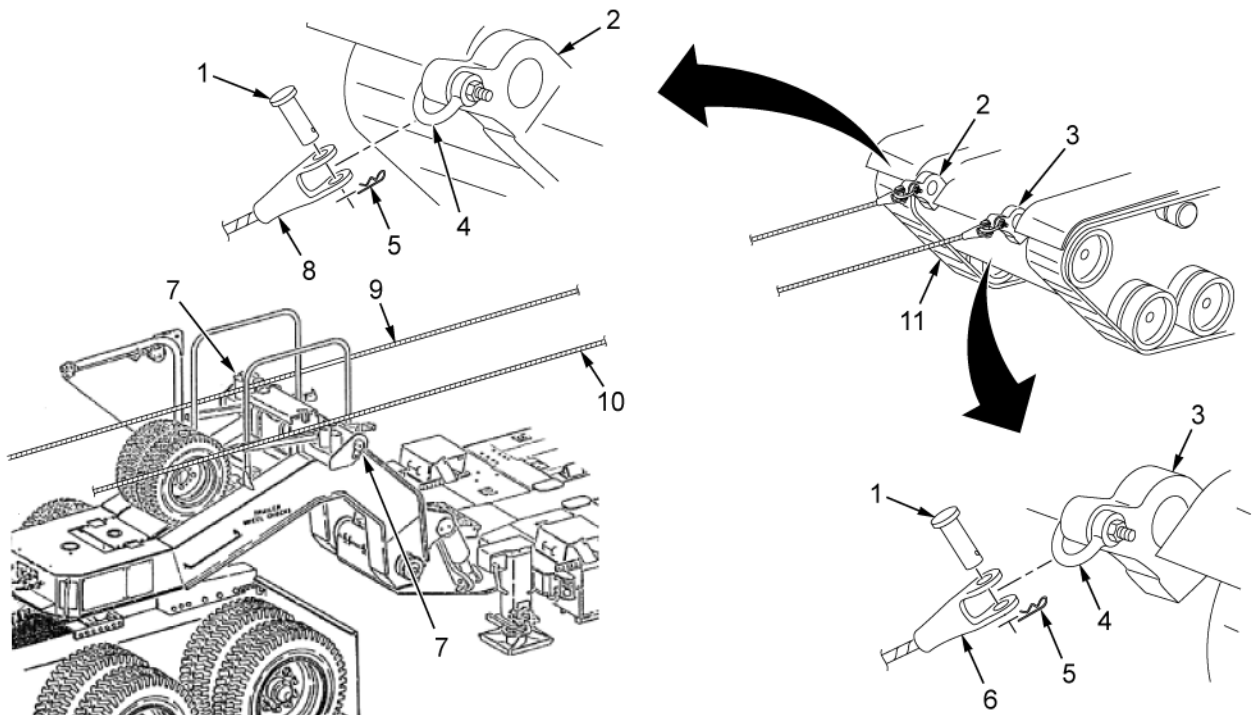
59. Route both driver and passenger side winch cables (Figure 17, Item 9 and Item 10) through gooseneck cable guides (Figure 17, Item 7).

NOTE

- When winching payloads onto the semitrailer, a straight winch cable pull is the preferred method.
- Crossed winch cable pulls may be used if significant directional control problems are expected.

60. With aid of an assistant, connect passenger side winch cable clevis (Figure 17, Item 8) to shackle (Figure 17, Item 4) on upper right recovery eye (Figure 17, Item 2) on payload (Figure 17, Item 11) and secure in place by installing shouldered pin (Figure 17, Item 1) and cotter pin (Figure 17, Item 5).

61. With aid of assistant, connect driver side winch cable clevis (Figure 17, Item 6) to shackle (Figure 17, Item 4) on upper left recovery eye (Figure 17, Item 3) on payload (Figure 17, Item 11) and secure in place by installing shouldered pin (Figure 17, Item 1) and cotter pin (Figure 17, Item 5).



HETT0129

Figure 17. Dual Winch Loading.

CAUTION

- The payload brake system must be released prior to winching payload onto semitrailer, or damage to equipment may result.
- WINCH SPEED CONTROL must be placed in LOW for MAX PULL when loading payloads, or damage to equipment may result.

NOTE

Ensure payload brakes are released. Station ground spotter on curbside of payload to provide direction to winch operator during winching operation.

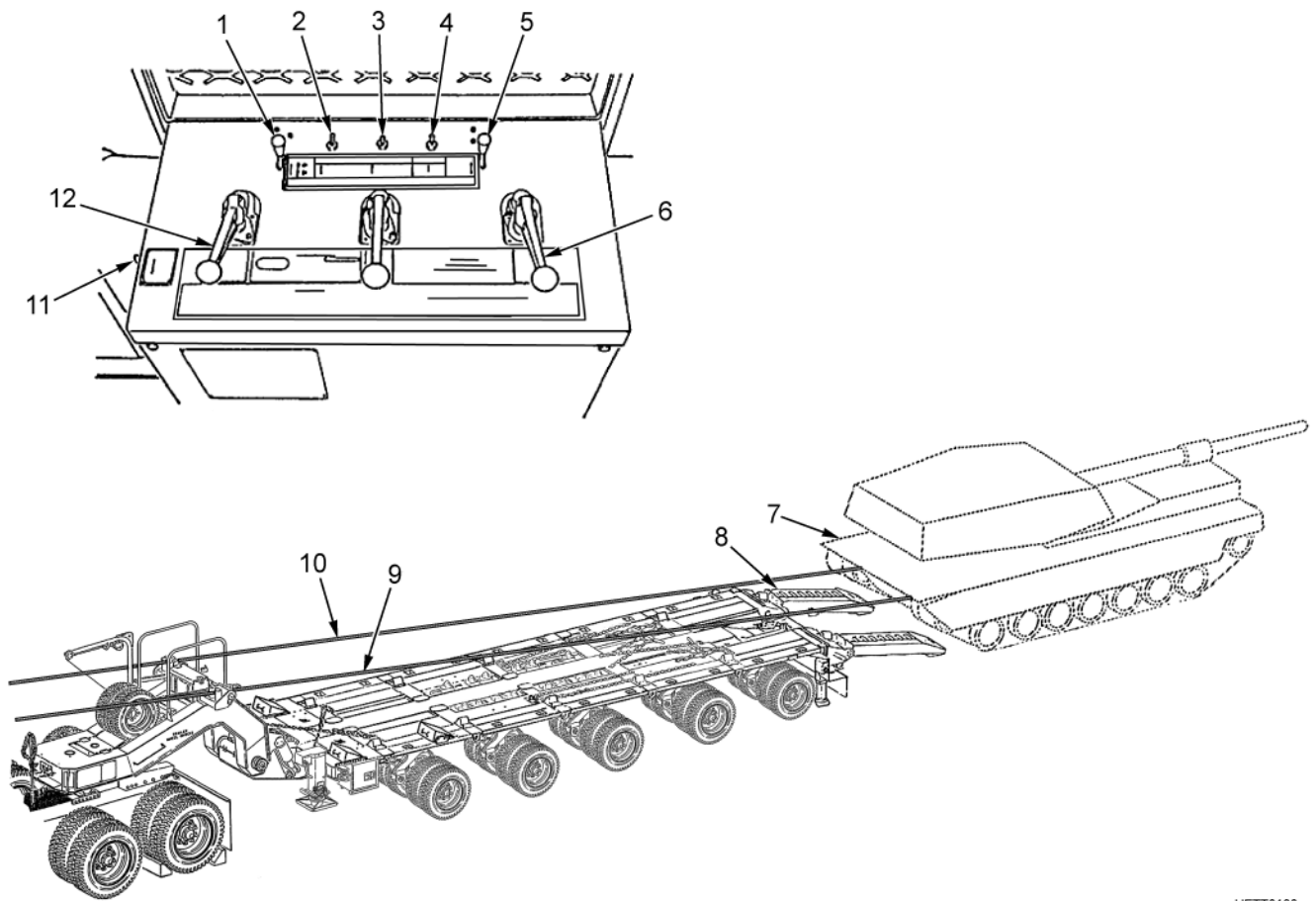
62. Pull WINCH SPEED CONTROL switch (Figure 18, Item 4) to LOW. Push engine SPEED CONTROL switch (Figure 18, Item 2) to HIGH engine IDLE. Momentarily push ENGINE SPEED CONTROL switch (Figure 18, Item 3) to lock engine speed at high idle (approximately 1,500 rpm), and then release ENGINE SPEED CONTROL switch.
63. Engage both DRIVER SIDE WINCH KICKOUT switch (Figure 18, Item 5) and PASSENGER SIDE WINCH KICKOUT switch (Figure 18, Item 1) by pushing on each switch. Push CABLE HOLD-DOWN lever (Figure 18, Item 11) to ON.
64. Winch operator must take up all slack in both driver and passenger side winch cables (Figure 18, Item 9 and Item 10) by pushing down on DRIVER SIDE WINCH lever (Figure 18, Item 6) and PASSENGER SIDE WINCH lever (Figure 18, Item 12). Release both levers when both winch cables are tight.

NOTE

- Prior to pulling the payload onto the ramps, the spotter must check the alignment of the payload tracks (inward edge) to the curb guides.
 - Perform steps 65 and 66 if adjustment is required to align the payload with the platform.
 - If the payload is angled toward curbside of the semitrailer, perform step 65.
 - Prior to making adjustments, the spotter must place scrap blocks of wood under streetside of the payload, just in front of the first roadwheel.
65. Winch operator must push down on PASSENGER SIDE WINCH lever (Figure 18, Item 12) and pull payload (Figure 18, Item 7) in alignment with ramps (Figure 18, Item 8) and then release lever (Figure 18, Item 12).

NOTE

- If the payload is angled toward street of the semitrailer, perform step 66.
 - Prior to making adjustments, the spotter must place scrap blocks of wood under curbside of the payload, just in front of the first roadwheel.
66. Winch operator must push down on DRIVER SIDE WINCH lever (Figure 18, Item 6) and pull payload (Figure 18, Item 7) in alignment with ramps (Figure 18, Item 8), and then release lever (Figure 18, Item 6).



HETT0130

Figure 18. Dual Winch Loading.

CAUTION

Winch operator must maintain even tension on both winch cables to keep payload centered with semitrailer as payload is loaded, or damage to equipment may result.

67. Winch operator must push down both DRIVER SIDE WINCH lever (Figure 19, Item 1) and PASSENGER SIDE WINCH lever (Figure 19, Item 2) to pull payload (Figure 19, Item 3) slowly up ramps (Figure 19, Item 4) onto platform (Figure 19, Item 8), adjusting pull on either cable (Figure 19, Item 10 or Item 11) as required to maintain alignment of payload tracks (Figure 19, Item 6) to curb guides (Figure 19, Item 9).
68. When track on streetside of payload (Figure 19, Item 6) makes contact with curbside rear payload chock (Figure 19, Item 7), winch operator must release both DRIVER SIDE WINCH lever (Figure 19, Item 1) and PASSENGER SIDE WINCH lever (Figure 19, Item 2) to stop payload (Figure 19, Item 3).
69. Chock streetside rear of payload (Figure 19, Item 3) using streetside rear payload chocks (Figure 19, Item 5).
70. Perform steps 61 through 64 of Loading Able Payloads (WP 0015) to adjust platform to normal running height.

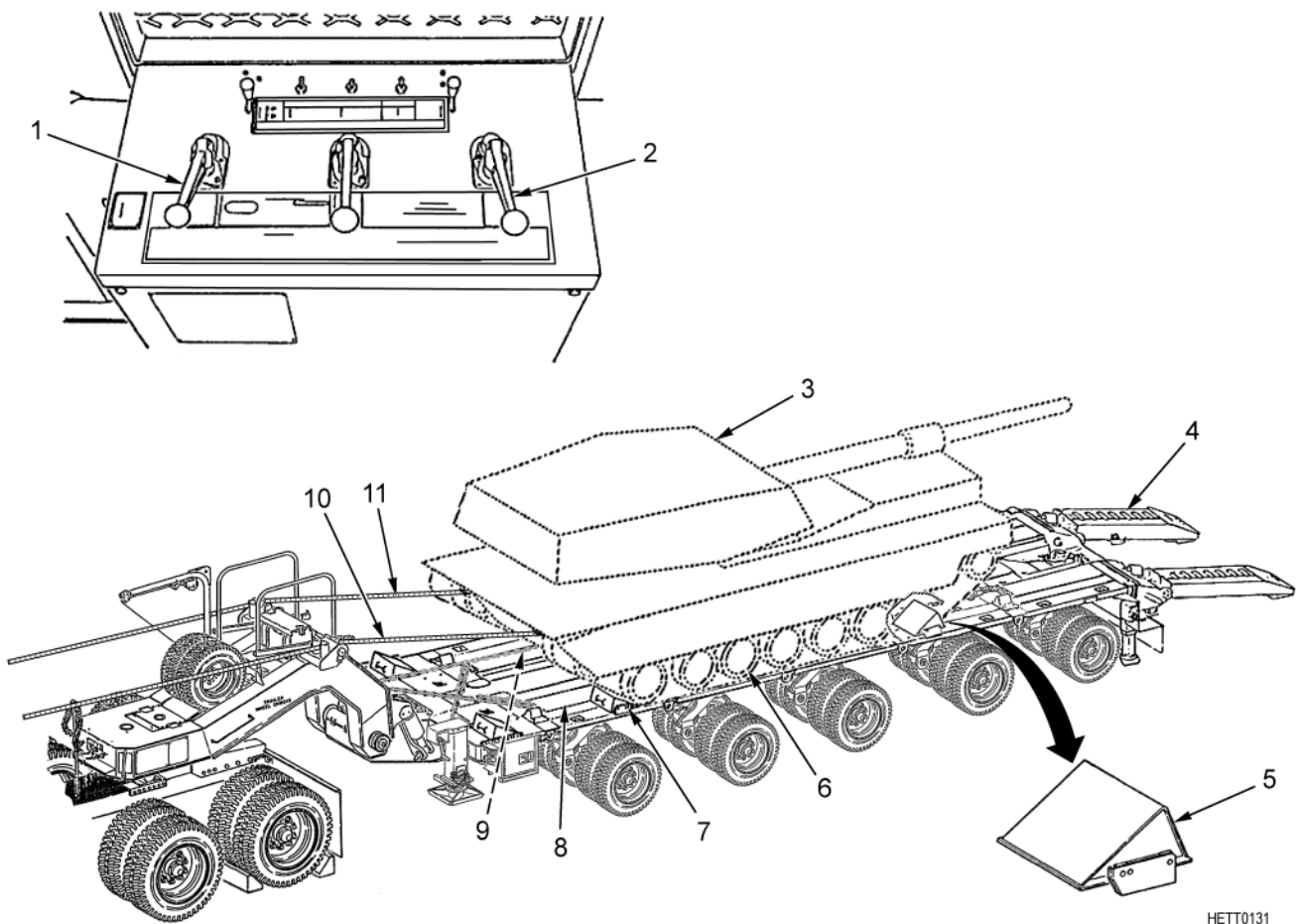


Figure 19. Dual Winch Loading.

71. Lift two front tiedown chains (Figure 20, Item 4) and attach to two front towing lugs (Figure 20, Item 1) using two shackles (Figure 20, Item 2) from platform stowage compartment.
72. Remove curbside rear payload chock (Figure 20, Item 3) from front streetside of payload (Figure 20, Item 5).

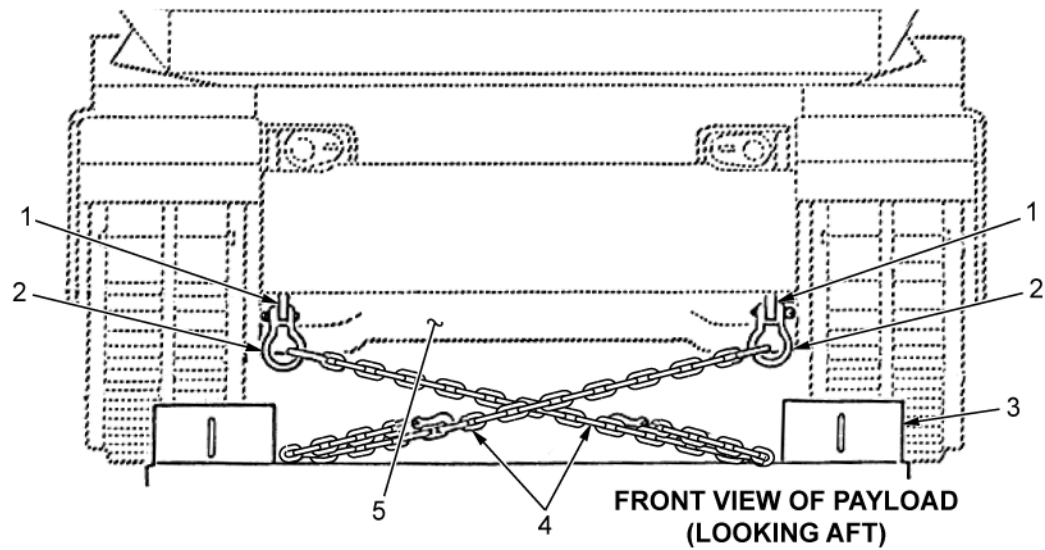


Figure 20. Dual Winch Loading.

73. Winch operator must push down on both DRIVER SIDE WINCH lever (Figure 21, Item 12) and PASSENGER SIDE WINCH lever (Figure 21, Item 13) until front tiedown chains (Figure 21, Item 6) are tight and payload tracks (front roadwheels) (Figure 21, Item 15) are firmly on front payload chocks (Figure 21, Item 4).
74. Place two rear payload chocks (Figure 21, Item 16) to rear curbside and streetside of payload (Figure 21, Item 5).

WARNING



Prior to removing winch cable from payload, winch operator must ensure each cable sags to top of tractor tires to relieve cable twist. Failure to follow this warning may result in injury to personnel.

75. Winch operator must pull up both DRIVER SIDE WINCH lever (Figure 21, Item 12) and PASSENGER SIDE WINCH lever (Figure 21, Item 13) until each winch cable (Figure 21, Item 2 and Item 1) sags to top of tractor tires (Figure 21, Item 14).

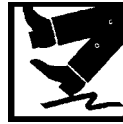
WARNING



- **Failure to extend safety rail while attaching or removing payload winch cable may cause injury to personnel.**
- **On some semitrailers a solar battery charger is mounted to the top of the gooseneck directly in front of the spare tires. Persons working on top of the gooseneck must take EXTREME care not to step on or trip over the solar battery charger.**

Failure to follow these warnings may result in injury to personnel or damage to equipment.

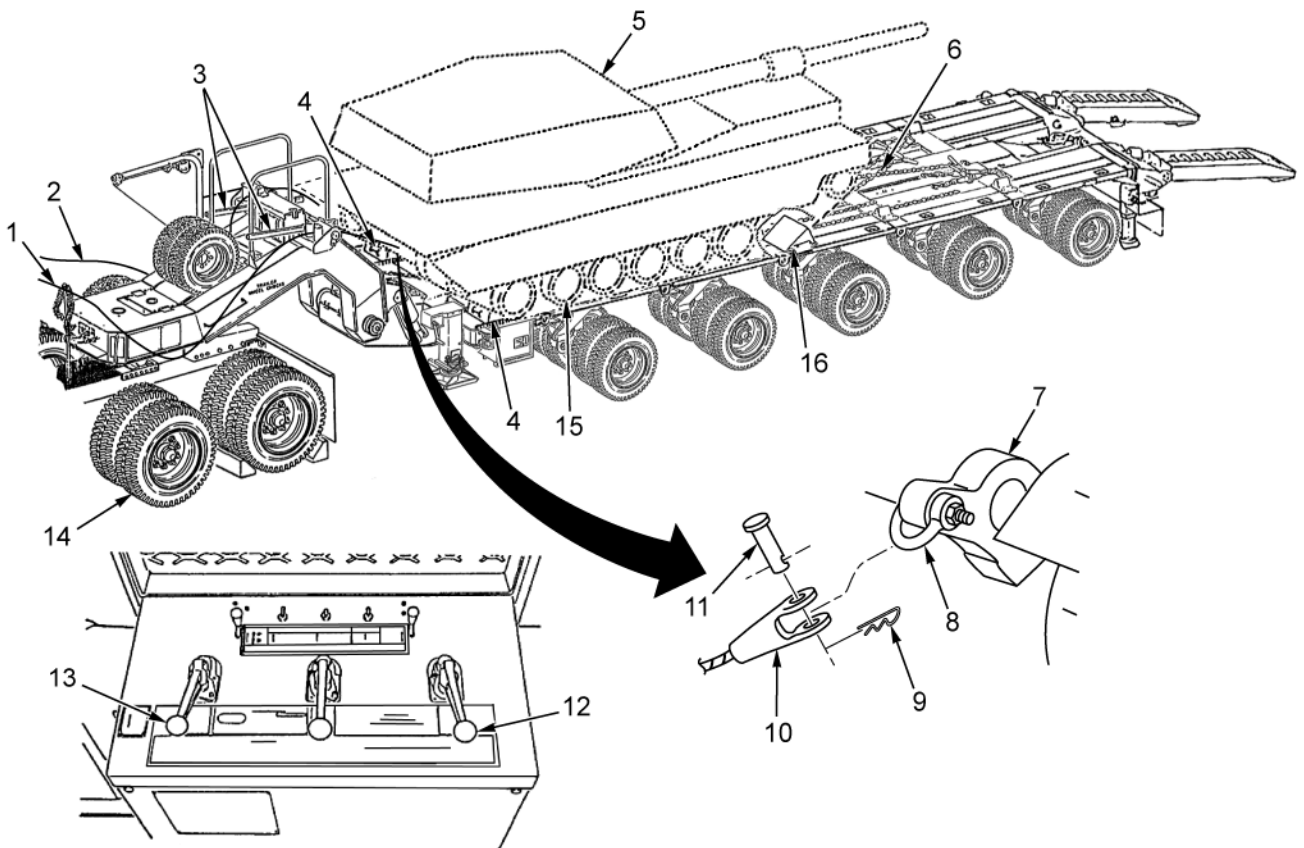
76. Unlatch and extend gooseneck safety rail (Figure 21, Item 3).
77. Check for twist in both winch cables (Figure 21, Item 2 and Item 1).
78. Remove cotter pins (Figure 21, Item 9) and shouldered pins (Figure 21, Item 11) from two clevises (Figure 21, Item 10) on both driver and passenger side winch cables (Figure 21, Item 2 and Item 1).
79. Remove cables (Figure 21, Item 2 and Item 1) from shackles (Figure 21, Item 9) on two upper recovery eyes (Figure 21, Item 7) on payload (Figure 21, Item 5).
80. Remove two large shackles (Figure 21, Item 8) from upper recovery eyes (Figure 21, Item 7) of payload (Figure 21, Item 5).

WARNING

- Failure to extend safety rail while attaching or removing the payload winch cable may cause injury to personnel.
- On some semitrailers a solar battery charger is mounted to the top of the gooseneck directly in front of the spare tires. Persons working on top of the gooseneck must take **EXTREME** care not to step on or trip over the solar battery charger.

Failure to follow these warnings may result in injury to personnel or damage to equipment.

81. Retract and latch gooseneck safety rail (Figure 21, Item 3).



HETT0133

Figure 21. Dual Winch Loading.

82. Install two large shackles (Figure 22, Item 2) and four load binders (Figure 22, Item 1) on rear payload tiedown ring (Figure 22, Item 3).
83. Perform steps 69 through 79 of Loading Able Payloads (WP 0015) to secure payload to semitrailer platform.

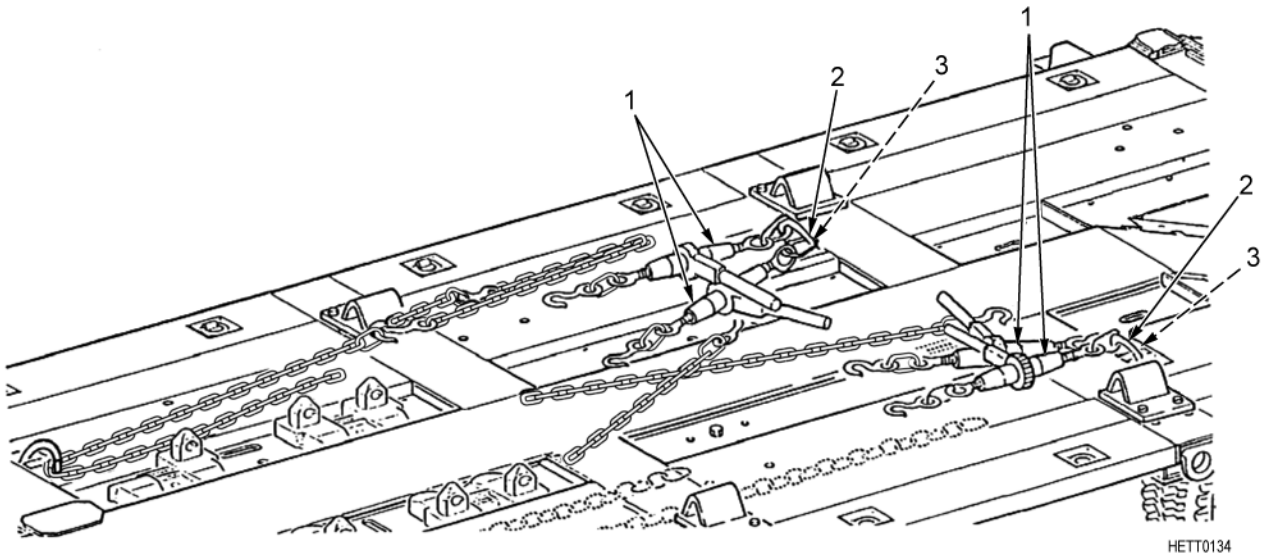


Figure 22. Dual Winch Loading.

84. Install two shouldered pins (Figure 23, Item 1) and cotter pins (Figure 23, Item 9) on winch cable clevises (Figure 23, Item 10 and Item 12).
85. Remove both winch cables (Figure 23, Item 11 and Item 13) from gooseneck cable guides (Figure 23, Item 14).

WARNING



DO NOT allow hands to get between clevis and winch. Failure to follow this warning may result in injury to personnel.

86. Using one person to push down on DRIVER SIDE WINCH lever (Figure 23, Item 4) and one person to maintain tension on DRIVER SIDE WINCH cable (Figure 23, Item 11), retract and stow DRIVER SIDE WINCH cable clevis (Figure 23, Item 8) onto stow hook (Figure 23, Item 7). Release DRIVER SIDE WINCH lever.
87. Using one person to push down on PASSENGER SIDE WINCH lever (Figure 23, Item 2) and one person to maintain tension on PASSENGER SIDE WINCH cable (Figure 23, Item 13), retract and stow PASSENGER SIDE WINCH cable clevis (Figure 23, Item 6) onto stow hook (Figure 23, Item 7). Release PASSENGER SIDE WINCH lever.
88. Pull ENGINE SPEED CONTROL (Figure 23, Item 3) switch to LOW ENGINE IDLE. Lower guard (Figure 23, Item 5) and lock guard in place.
89. Raise and secure ramps, and restow curb guides, crowbar, and all tools used during this procedure (WP 0009).

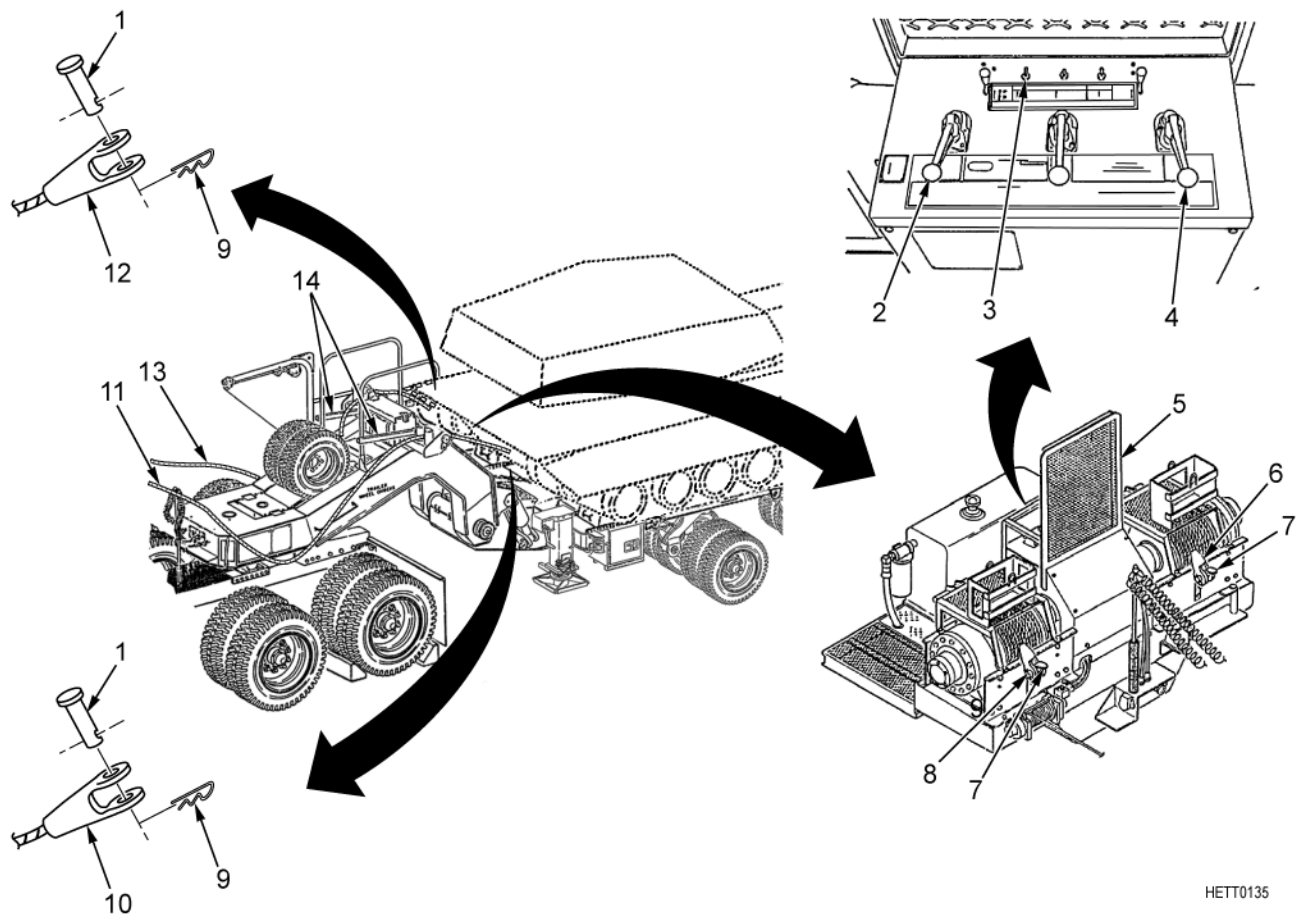
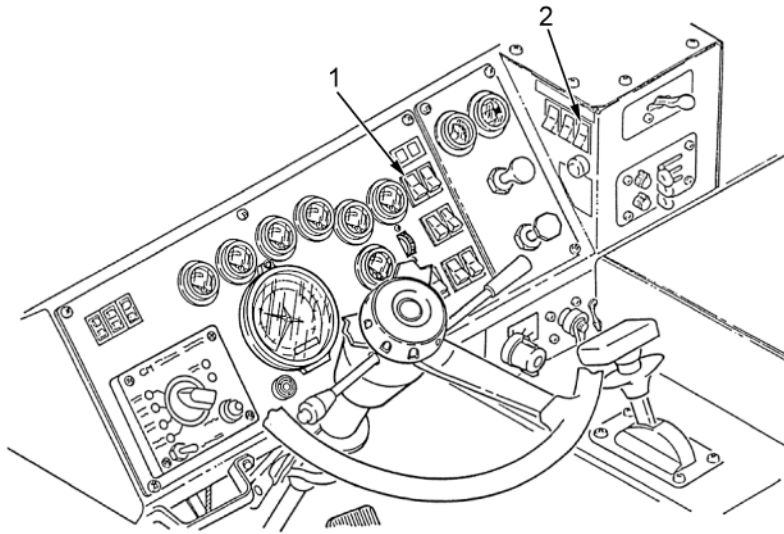


Figure 23. Dual Winch Loading.

90. In M1070 tractor cab, set PTO switch (Figure 24, Item 2) and beacon light switch (Figure 24, Item 1) to OFF position.



HETT0136

Figure 24. Dual Winch Loading.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**OPERATION UNDER USUAL CONDITIONS - DUAL WINCH UNLOADING**

INITIAL SETUP:**Personnel Required**

2

WP 0012

WP 0015

WP 0016

TB 43-0142

References

WP 0008

WP 0009

GENERAL INFORMATION

This work package contains instructions for unloading a disabled payload (M1 Series Main Battle Tank) on the Heavy Equipment Transporter (HET) M1000 semitrailer coupled to a U.S. Army M1070 or M911 tractor.

Included are procedures for payloads that DO NOT roll freely and procedures for payloads that are free-rolling.

DUAL WINCH UNLOADING FOR NON-FREE ROLLING PAYLOAD

1. Perform steps 1 through 8 of Unloading Able Payloads (WP 0016) to position tractor/semitrailer, adjust ramp span width, and position curb guides.

WARNING

- Provide ample clear space behind the disabled payload during unloading, if possible, to protect personnel and prevent damage to equipment should cables break while payload is being unloaded.
- Ensure all ground personnel stand clear of winch cables except when handling cables.
- Use extreme caution during any operation on a slope.
- Ensure winch cables are not kinked, clevises are secure to winch cables, and snatch blocks and shackles are in good condition and properly secured.
- Ensure winch cables are inspected in accordance with TB 43-0142.
- Ensure a ground spotter stands off curbside of semitrailer and maintains visual contact with the winch operator. The spotter must observe cables, snatch blocks, shackles, and payload position during unloading.
- **DO NOT** overload tractor winches. Know the rating of the winches being used and any protection devices (such as shear pins).
- **DO NOT** at any time during unloading operations, while the payload is being pulled off with winches, allow personnel to be on the semitrailer platform.
- Always wear leather gloves when handling cable. Never allow cable to run through hands.

Failure to follow these warnings may result in injury to personnel and damage to equipment.

NOTE

Ensure that the M1070 tractor parking brake is applied. The Power Take Off (PTO) will not engage unless the tractor parking brake is set.

2. Turn beacon light switch (Figure 1, Item 1) to ON position. With engine idling, set PTO switch (Figure 1, Item 2) to ON.

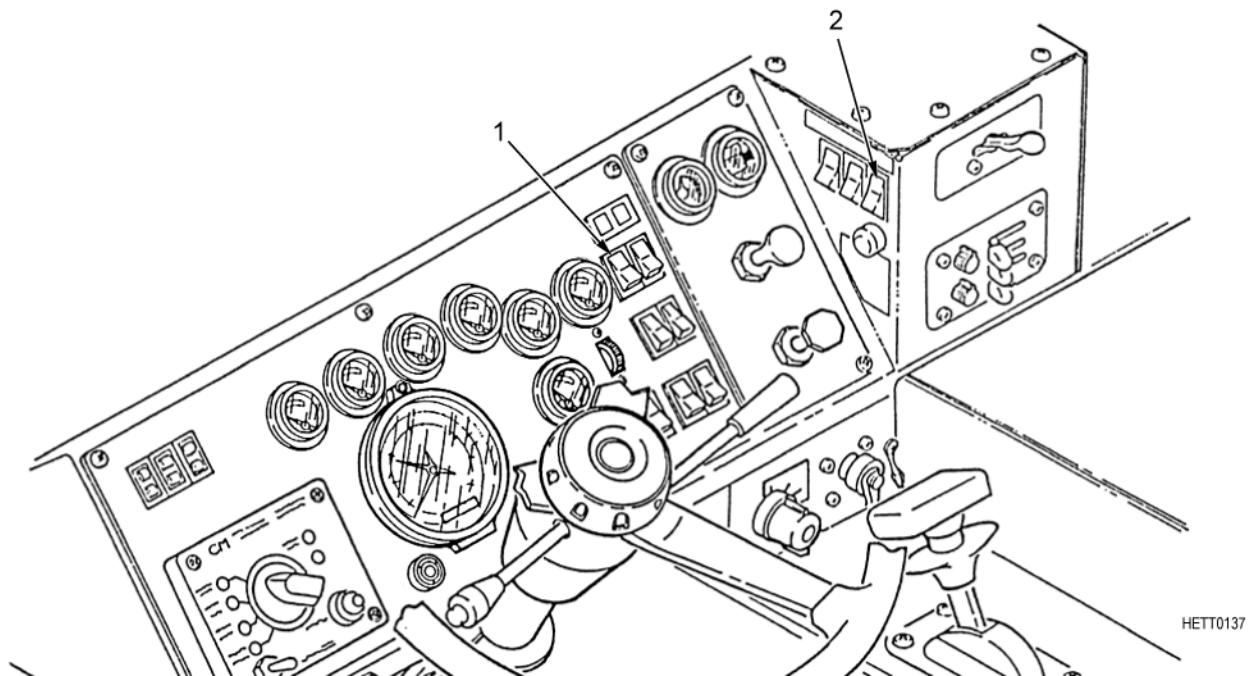


Figure 1. Dual Winch Unloading.

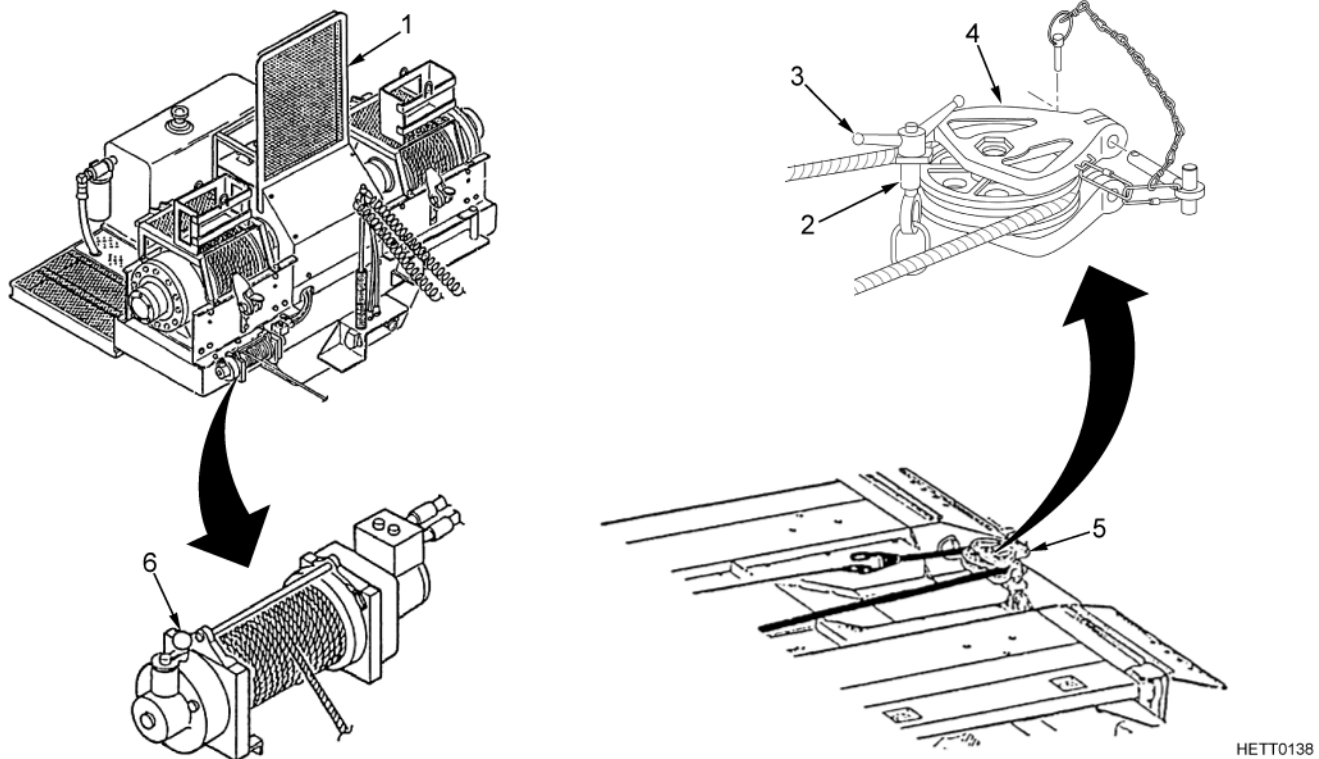
3. Loosen handle (Figure 2, Item 3) of snatch block stow clamp (Figure 2, Item 2) and remove snatch block (Figure 2, Item 4) from stowed position off platform stow pins (Figure 2, Item 5).

WARNING



Hearing protection must be worn when near winching station or operating winches. Failure to follow this warning may result in injury to personnel.

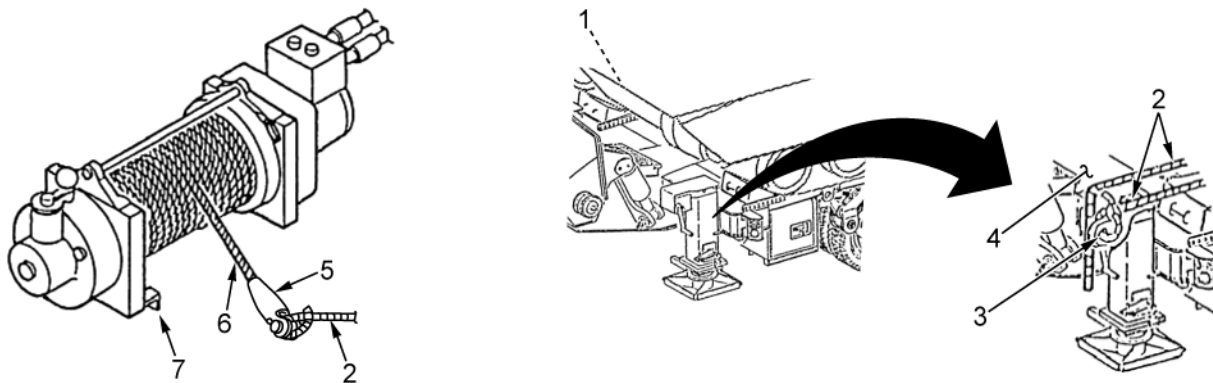
4. Raise guard (Figure 2, Item 1) and lock in upright position. Release AUXILIARY WINCH KICKOUT by lifting and rotating lever (Figure 2, Item 6) counterclockwise.



HETT0138

Figure 2. Dual Winch Unloading.

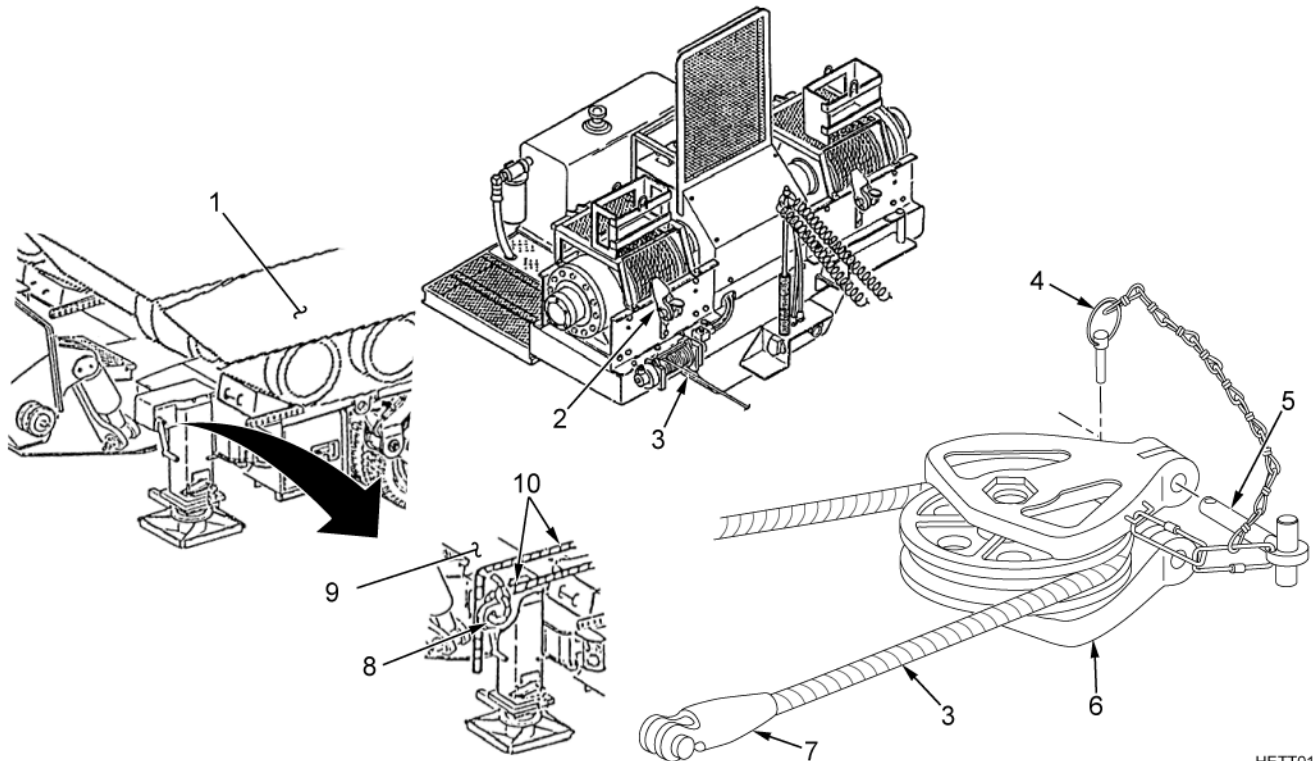
5. Untie manila rope (Figure 3, Item 2) from curbside front lifting eye (Figure 3, Item 3) on platform (Figure 3, Item 4) and move end of rope to streetside front lifting eye (Figure 3, Item 1).
6. Unhook auxiliary winch cable (Figure 3, Item 6) from stow hook (Figure 3, Item 7). Pull auxiliary winch cable to free end of manila rope (Figure 3, Item 2) and tie rope to auxiliary winch cable clevis (Figure 3, Item 5).



HETT0139

Figure 3. Dual Winch Unloading.

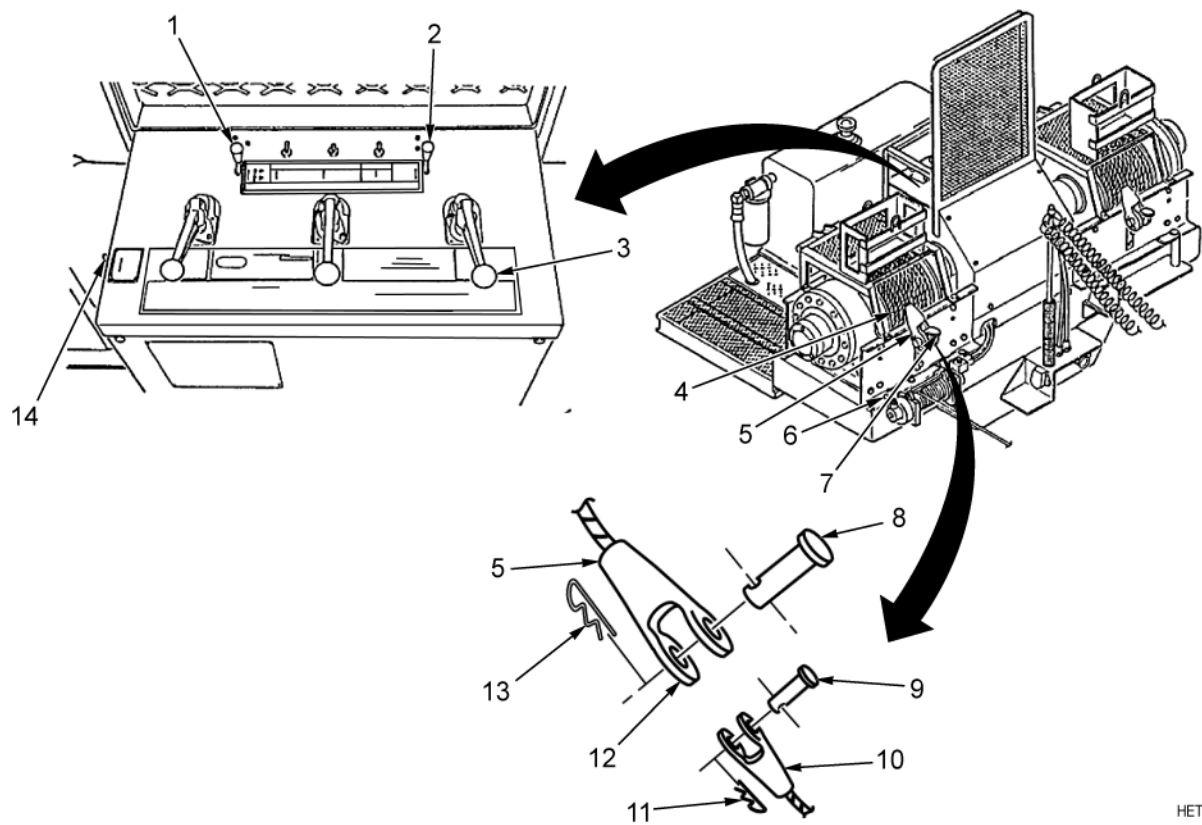
7. Untie manila rope (Figure 4, Item 10) from streetside front lifting eye (Figure 4, Item 8) on platform (Figure 4, Item 9) and use manila rope to pull auxiliary winch cable (Figure 4, Item 3) rearward under payload (Figure 4, Item 1) to snatch block (Figure 4, Item 6).
8. Remove linch pin (Figure 4, Item 4) and keeper pin (Figure 4, Item 5) to open snatch block (Figure 4, Item 6). Pass auxiliary winch cable (Figure 4, Item 3), curbside to streetside, through snatch block.
9. Close snatch block (Figure 4, Item 6) and reinstall keeper pin (Figure 4, Item 5). Secure keeper pin with linch pin (Figure 4, Item 4).
10. Continue pulling manila rope (Figure 4, Item 10) forward until auxiliary cable winch clevis (Figure 4, Item 7) reaches driver side winch cable clevis (Figure 4, Item 2). Untie manila rope from auxiliary winch cable clevis.



HETT0140

Figure 4. Dual Winch Unloading.

11. Ensure both DRIVER SIDE WINCH KICKOUT (Figure 5, Item 2) and PASSENGER SIDE WINCH KICKOUT (Figure 5, Item 1) switches are ENGAGED (pushed away from operator).
12. Ensure CABLE HOLD-DOWN lever (Figure 5, Item 14) is ON (pushed away from operator).
13. Pull DRIVER SIDE WINCH lever (Figure 5, Item 3) upward momentarily until there is enough slack in driver side winch cable (Figure 5, Item 4) to be removed from stow hook (Figure 5, Item 7). Move winch cable clevis (Figure 5, Item 5) off of stow hook to unstow winch cable. Continue paying out winch cable until spotter on ground can reach winch cable clevis. Release DRIVER SIDE WINCH lever.
14. Remove and retain cotter pin (Figure 5, Item 13) and shouldered pin (Figure 5, Item 8) from clevis (Figure 5, Item 5) on driver side winch cable (Figure 5, Item 4).
15. Remove cotter pin (Figure 5, Item 11) and shouldered pin (Figure 5, Item 9) from auxiliary winch cable clevis (Figure 5, Item 10).
16. Install auxiliary winch cable clevis (Figure 5, Item 10) over one ear (Figure 5, Item 12) on driver side winch cable clevis (Figure 5, Item 5).
17. Install shouldered pin (Figure 5, Item 9) and cotter pin (Figure 5, Item 11) on clevis (Figure 5, Item 10).
18. Engage AUXILIARY WINCH KICKOUT by lifting and rotating lever (Figure 5, Item 6) clockwise. Disengage DRIVER SIDE WINCH KICKOUT (Figure 5, Item 2) switch by pulling switch.



HETT0141

Figure 5. Dual Winch Unloading.

WARNING

DO NOT allow auxiliary winch cable to cross itself or knot up on winch. Failure to follow this warning may result in injury to personnel.

19. With aid of an assistant, use one person to operate winch controls (Figure 6, Item 1, Item 2, Item 13, and Item 16) and a second person to ensure winch cable clevises (Figure 6, Item 7 and Item 10) DO NOT hang up on platform (Figure 6, Item 14). Push down on AUXILIARY WINCH lever (Figure 6, Item 13) to pull driver side winch cable (Figure 6, Item 15) to snatch block (Figure 6, Item 6).
20. If auxiliary winch cable (Figure 6, Item 9) does not pull driver side winch cable (Figure 6, Item 15), push ENGINE SPEED CONTROL switch (Figure 6, Item 1) to HIGH ENGINE IDLE. Momentarily push ENGINE SPEED LOCK switch (Figure 6, Item 2) to lock engine speed at high idle (approximately 1,500 rpm) and then release ENGINE SPEED LOCK switch.

NOTE

To keep winch cable clevis from becoming stuck on platform, spotter should watch clevis as it passes under the payload.

21. Winch operator must release lever (Figure 6, Item 13) when driver side winch cable (Figure 6, Item 15) reaches snatch block (Figure 6, Item 6).
22. Spotter must pull on driver side winch cable (Figure 6, Item 15) to get enough slack so that cable can be passed through snatch block (Figure 6, Item 6). Unfasten lynch pin (Figure 6, Item 4) from keeper pin (Figure 6, Item 5). Remove keeper pin from snatch block, and lift and open snatch block. Pass driver side winch cable through snatch block.
23. Once driver side winch cable (Figure 6, Item 15) is past pulley (Figure 6, Item 3) on snatch block (Figure 6, Item 6), close snatch block and reinstall keeper pin (Figure 6, Item 5). Secure keeper pin to snatch block with lynch pin (Figure 6, Item 4).
24. Winch operator must push down and hold AUXILIARY WINCH lever (Figure 6, Item 13) to pull driver side winch cable (Figure 6, Item 15) to front streetside of payload.
25. Winch operator must release lever (Figure 6, Item 13) when winch cable (Figure 6, Item 15) is approximately 12 in. (30 cm) past streetside front of platform (Figure 6, Item 14).

WARNING

Prior to disconnecting any winch cables, be sure each cable is not twisted. A twisted winch cable, when operated, may develop extreme tension. Failure to follow this warning may cause injury to personnel when cable clevis is removed.

26. Remove cotter pin (Figure 6, Item 11) and shouldered pin (Figure 6, Item 8) from auxiliary cable clevis (Figure 6, Item 10). Remove auxiliary cable clevis from driver side winch cable clevis (Figure 6, Item 7).
27. With aid of an assistant, use one person to push downward on AUXILIARY WINCH lever (Figure 6, Item 13) and one person to maintain tension on auxiliary winch cable (Figure 6, Item 9). Retract auxiliary winch cable and restow cable on stow hook (Figure 6, Item 12).
28. Move CABLE HOLD-DOWN lever (Figure 6, Item 16) to OFF.

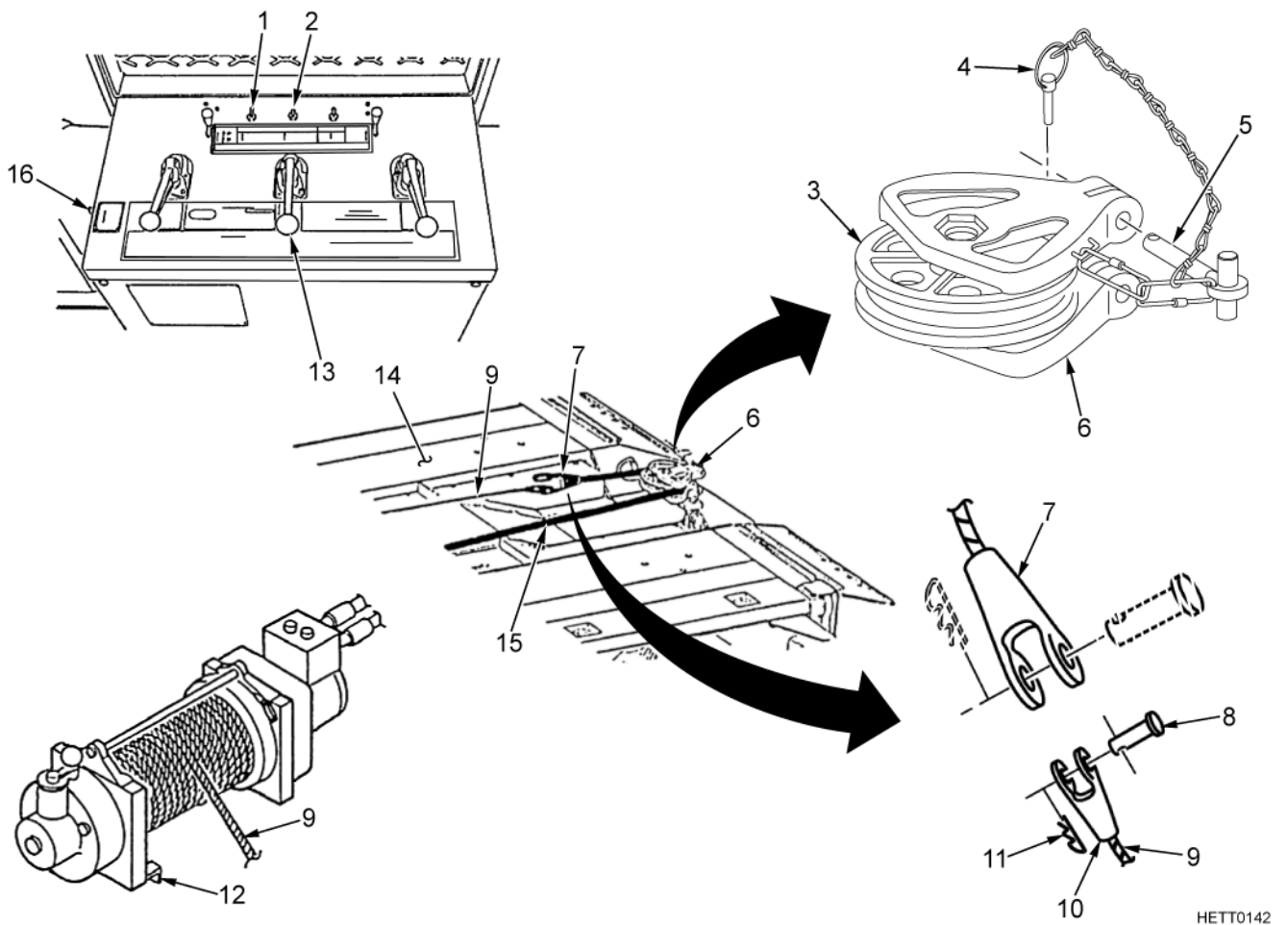


Figure 6. Dual Winch Unloading.

29. Pull driver side winch cable (Figure 7, Item 14) to curbside front of payload (Figure 7, Item 12) and route over both front tiedown chains (Figure 7, Item 13).
30. Attach driver side winch cable (Figure 7, Item 14) to pear ring (Figure 7, Item 15) on front curbside tiedown chain (Figure 7, Item 13) next to shackle (Figure 7, Item 16) on curbside front towing lug (Figure 7, Item 17). Secure winch cable by installing shouldered pin (Figure 7, Item 5) and cotter pin (Figure 7, Item 8).
31. Route driver side winch cable (Figure 7, Item 14) through streetside gooseneck cable guide (Figure 7, Item 25) and around pivot pin sheave (Figure 7, Item 23).
32. Pull PASSENGER SIDE WINCH lever (Figure 7, Item 22) upward momentarily until there is enough slack in passenger side winch cable (Figure 7, Item 1) to be removed from stow hook (Figure 7, Item 3). Move winch cable clevis (Figure 7, Item 2) from stow hook to unstow passenger side winch cable. Continue paying out passenger side winch cable until spotter on the ground can reach clevis. Release PASSENGER SIDE WINCH lever.

33. Disengage PASSENGER SIDE WINCH KICKOUT switch (Figure 7, Item 21) by pulling on PASSENGER SIDE WINCH KICKOUT switch.
34. Remove cotter pin (Figure 7, Item 8) and shouldered pin (Figure 7, Item 5) from clevis (Figure 7, Item 4) on passenger side winch cable (Figure 7, Item 1).
35. Winch operator must pull WINCH SPEED CONTROL switch (Figure 7, Item 18) to LOW. Push ENGINE SPEED CONTROL switch (Figure 7, Item 20) to HIGH ENGINE IDLE. Momentarily push ENGINE SPEED LOCK switch (Figure 7, Item 19) to lock engine speed at high idle (approximately 1,500 rpm), and then release ENGINE SPEED LOCK switch.
36. Remove two large shackles (Figure 7, Item 7) from four load binders (Figure 7, Item 9) and rear payload tiedown ring (Figure 7, Item 10).

WARNING



- Failure to extend safety rail while attaching or removing payload winch cable may cause injury to personnel.
- On some semitrailers a solar battery charger is mounted to the top of the gooseneck directly in front of the spare tires. Persons working on top of the gooseneck must take **EXTREME** care not to step on or trip over it.

Failure to follow these warnings may result in injury to personnel or damage to equipment.

37. Unlatch and extend gooseneck safety rail (Figure 7, Item 24).
38. Install large shackle (Figure 7, Item 7) to upper right recovery eye (Figure 7, Item 6) and upper left recovery eye (Figure 7, Item 11).
39. Pull out passenger side winch cable (Figure 7, Item 1) and attach clevis (Figure 7, Item 2) to shackle (Figure 7, Item 7) on payload upper right recovery eye (Figure 7, Item 6). Secure passenger side winch cable by installing shouldered pin (Figure 7, Item 5) and cotter pin (Figure 7, Item 8).

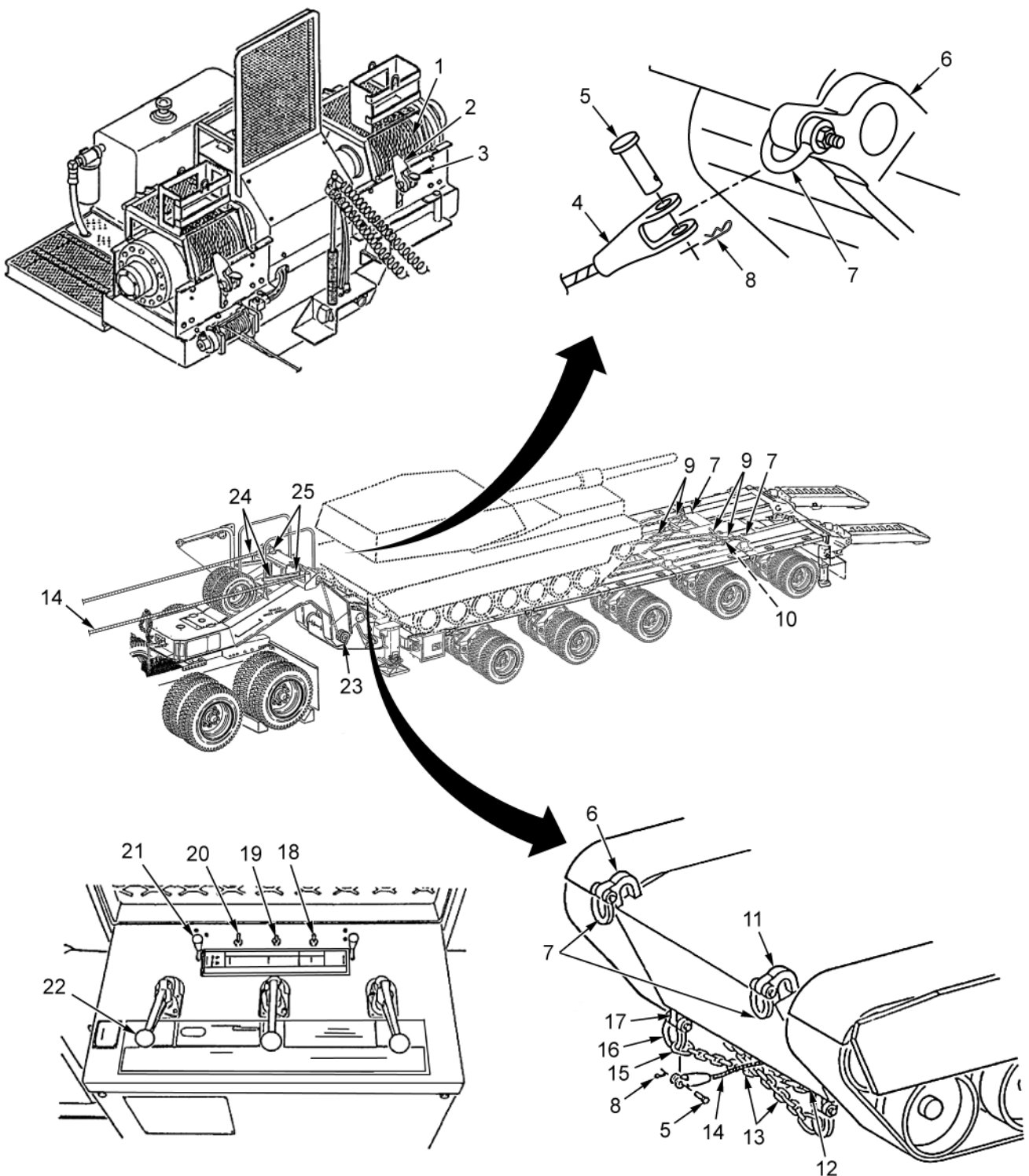
WARNING



- Failure to retract and latch gooseneck safety rail before operating tractor/trailer will result in damage to equipment.
- On some semitrailers a solar battery charger is mounted to the top of the gooseneck directly in front of the spare tires. Persons working on top of the gooseneck must take **EXTREME** care not to step on or trip over it.

Failure to follow these warnings may result in injury to personnel or damage to equipment.

40. Retract and latch gooseneck safety rail (Figure 7, Item 24).
41. Route passenger side winch cable (Figure 7, Item 1) through gooseneck cable guide (Figure 7, Item 25).
42. Winch operator must engage PASSENGER SIDE WINCH KICKOUT switch (Figure 7, Item 21) by pushing in on PASSENGER SIDE WINCH KICKOUT switch. Momentarily push down and release PASSENGER SIDE WINCH lever (Figure 7, Item 22) to remove slack in passenger side winch cable (Figure 7, Item 1).



HETT0143

Figure 7. Dual Winch Unloading.

43. Spotter must move streetside rear payload chock (Figure 8, Item 8) back over No. 4 bogie (Figure 8, Item 7). Spotter must place curbside rear payload chock (Figure 8, Item 9) on the ground on streetside of platform (Figure 8, Item 6).

WARNING



The driver side winch cable will be used to pull back the payload. The passenger side winch cable will be used to restrain the payload. DO NOT allow the driver side winch cable to pull against the passenger side winch cable or the chain will part. Failure to follow this warning may result in serious injury to personnel.

44. Winch operator must engage DRIVER SIDE WINCH KICKOUT switch (Figure 8, Item 2) by pushing DRIVER SIDE WINCH KICKOUT switch. Push down DRIVER SIDE WINCH lever (Figure 8, Item 3) to move payload (Figure 8, Item 4) back to streetside rear payload chock (Figure 8, Item 8). Pull up PASSENGER SIDE WINCH lever (Figure 8, Item 1) just enough to remove slack from passenger side winch cable (Figure 8, Item 16).
45. Winch operator must release DRIVER SIDE WINCH lever (Figure 8, Item 3) and PASSENGER SIDE WINCH lever (Figure 8, Item 1) when payload (Figure 8, Item 4) makes firm contact with streetside rear payload chock (Figure 8, Item 8). Spotter must place curbside rear payload chock (Figure 8, Item 9) firmly against streetside front of payload to chock payload.

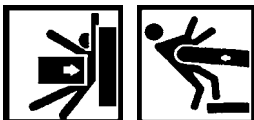
WARNING



Prior to removing the winch cable from the payload, winch operator must ensure each cable sags and touches the platform to relieve cable torque. Failure to follow this warning may result in serious injury to personnel.

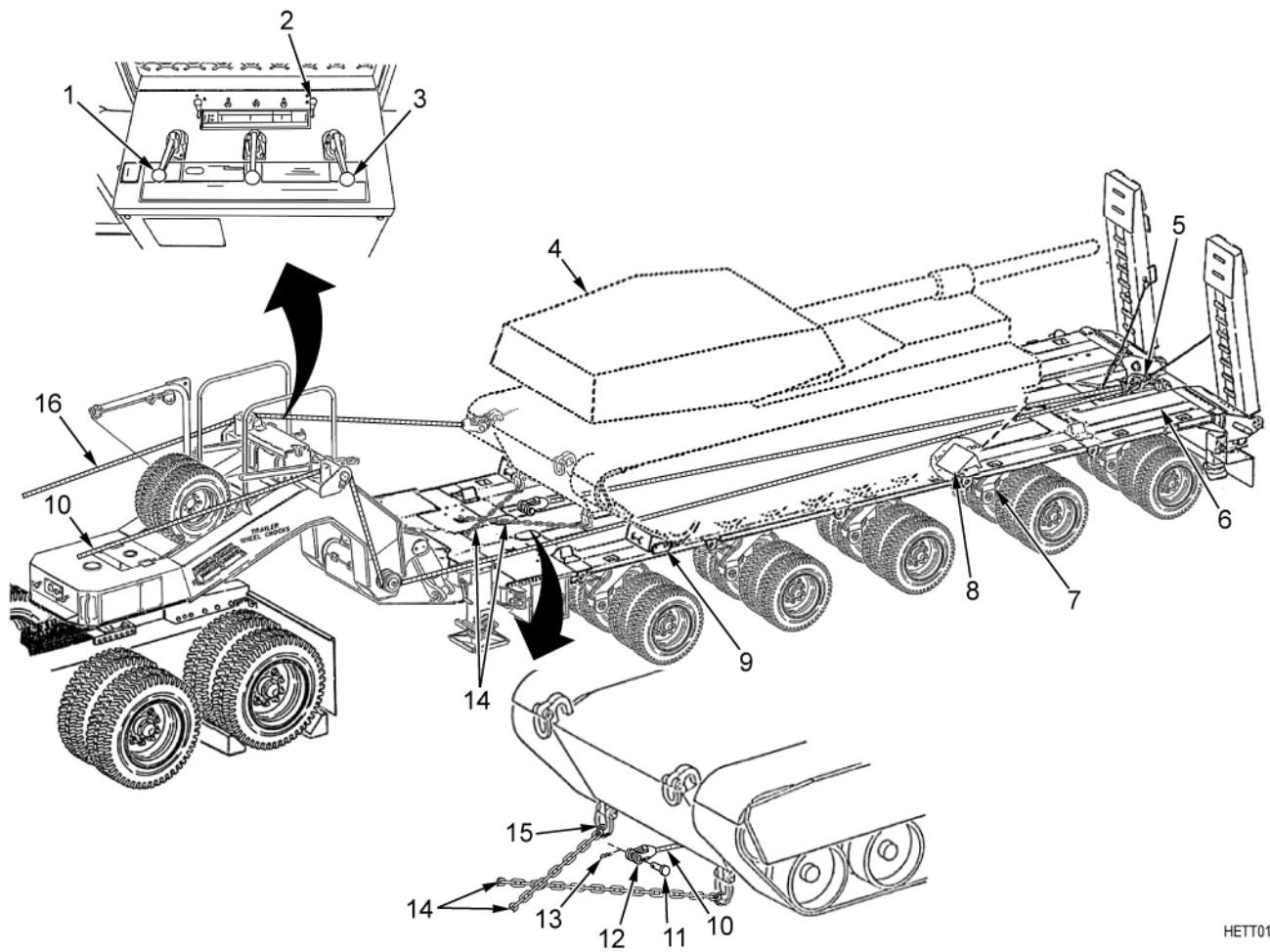
46. Winch operator must pull up DRIVER SIDE WINCH lever (Figure 8, Item 3) to give slack in driver side winch cable (Figure 8, Item 10). Release DRIVER SIDE WINCH lever when driver side winch cable is laying on platform (Figure 8, Item 6) between front tiedown chains (Figure 8, Item 14) and snatch block (Figure 8, Item 5).

WARNING



Extreme caution must be used when removing winch cables. Cable may be under tension or may be twisted. If winch cable has tension when removed, slowly and carefully rotate cable to relieve tension. DO NOT allow cable to twist or whip freely. Failure to follow this warning may result in injury to personnel.

47. Check for twist in driver side winch cable (Figure 8, Item 10). Remove and retain cotter pin (Figure 8, Item 13) and shouldered pin (Figure 8, Item 11) from driver side winch cable clevis (Figure 8, Item 12).
48. Remove driver side winch cable (Figure 8, Item 10) from pear ring (Figure 8, Item 15) on curbside front payload tiedown chain (Figure 8, Item 14). Disconnect one payload tiedown chain from payload (Figure 8, Item 4) and platform (Figure 8, Item 6), and lay chain on platform in front of payload. Disconnect other payload tiedown chain from platform only. Leave chain connected to payload.



HETT0144

Figure 8. Dual Winch Unloading.

NOTE

Shackles used to tie down payload may be removed as required and used for the following steps.

49. Attach shackle (Figure 9, Item 17) and one front payload tiedown chain (Figure 9, Item 15) to payload lower tiedown lugs (Figure 9, Item 14). Allow as much slack as possible in tiedown chain. This forms the Y-chain (Figure 9, Item 12) to be used to winch payload (Figure 9, Item 11) off of platform (Figure 9, Item 16).

CAUTION

Always connect the winch cable to the center-most point on the continuous portion of the Y-chain, not on the wraparound portion that has a hook on the end, or the hook may disconnect under load and cause damage to equipment.

50. Attach driver side winch cable clevis (Figure 9, Item 8) to center of Y-chain (Figure 9, Item 12) using a shackle (Figure 9, Item 13). (If using 3/4 in. (1.9 cm) chains, use two shackles.) Install shouldered pin (Figure 9, Item 9) and cotter pin (Figure 9, Item 10) on clevis. Winch operator must push down on DRIVER SIDE WINCH lever (Figure 9, Item 5) and take up slack in driver side winch cable (Figure 9, Item 7).
51. Lower both rear support legs until slightly below mud flaps (WP 0012).

WARNING



A spotter is required for unloading operations. The winch operator must maintain visual contact with the spotter at all times. Failure to follow this warning may result in injury to personnel.

52. Position spotter on curbside of payload to maintain visual contact with winch operator.

WARNING



- Winch operator and spotter must read steps 63 through 67 and be completely familiar with the sequence of steps prior to using winches.
- Personnel must not be on the platform during the winching operation. The winch operator must off load the payload slowly.
- During winching operation, ensure that one cable is always under tension and the other cable has some slack so that the two winches are NEVER pulling against each other.
- Payload adjustments, side-to-side (turning), must be kept to a minimum. Spotter must notify winch operator of any required payload adjustments while unloading.

Failure to follow these warnings may result in injury to personnel and damage to equipment.

53. Pull WINCH SPEED CONTROL switch (Figure 9, Item 4) to LOW. Push ENGINE SPEED CONTROL switch (Figure 9, Item 2) to HIGH ENGINE IDLE. Momentarily push ENGINE SPEED LOCK CONTROL switch (Figure 9, Item 3) to lock engine speed at high idle (approximately 1,500 rpm), and then release ENGINE SPEED LOCK CONTROL switch.
54. Winch operator must push down PASSENGER SIDE WINCH lever (Figure 9, Item 1) to pull payload (Figure 9, Item 11) slightly forward, off of rear payload chocks (Figure 9, Item 6). Release PASSENGER SIDE WINCH lever.

55. Pull WINCH SPEED CONTROL switch (Figure 9, Item 4) to LOW. Push ENGINE SPEED CONTROL switch (Figure 9, Item 2) to HIGH ENGINE IDLE. Momentarily push ENGINE SPEED LOCK CONTROL switch (Figure 9, Item 3) to lock engine speed at high idle (approximately 1,500 rpm), and then release ENGINE SPEED LOCK CONTROL switch (Figure 9, Item 3).
56. Winch operator must push down PASSENGER SIDE WINCH lever (Figure 9, Item 1) to pull payload (Figure 9, Item 11) slightly forward, off of rear payload chocks (Figure 9, Item 6). Release PASSENGER SIDE WINCH lever.

NOTE

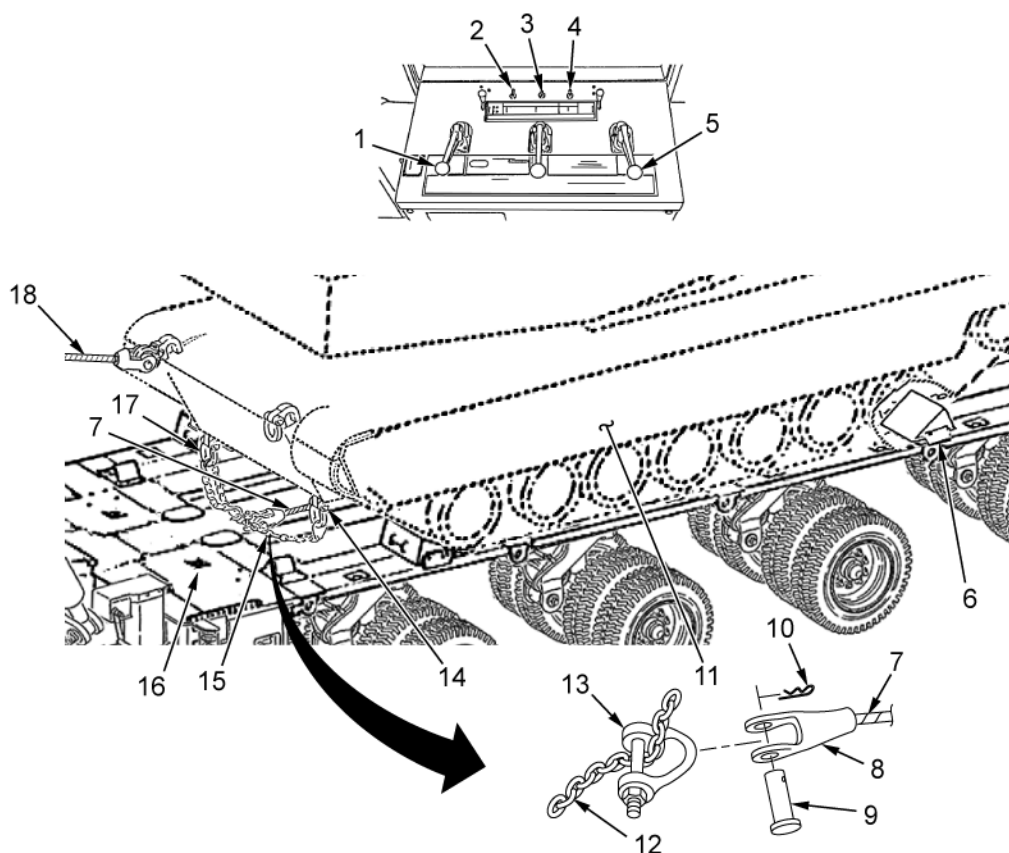
Move both rear payload chocks to rear of platform, just in front of beavertail and approximately in line with snatch block.

57. Winch operator must pull up PASSENGER SIDE WINCH lever (Figure 9, Item 1) in order to pay out passenger side winch cable (Figure 9, Item 18), which will restrain payload (Figure 9, Item 11). Push down DRIVER SIDE WINCH lever (Figure 9, Item 5) to take up driver side winch cable (Figure 9, Item 7).

NOTE

As long as driver side cable is pulling payload, winch operator must keep a slight sag in passenger side cable.

58. If payload (Figure 9, Item 11) rolls on its own, winch operator must allow slack in driver side winch cable (Figure 9, Item 7) and keep tension on passenger side winch cable (Figure 9, Item 18) to control speed of roll.
59. Continue winching until payload (Figure 9, Item 11) reaches rear payload chocks (Figure 9, Item 6). Release levers (Figure 9, Item 1 and Item 5).



HETT0146

Figure 9. Dual Winch Unloading.

WARNING

Extreme caution must be used when removing winch cables from payload. Cable may be under tension or may be twisted. If winch cable has tension when removed, slowly and carefully, using both hands, rotate cable to relieve tension. DO NOT allow cable to twist or whip freely. Failure to follow this warning may result in injury to personnel.

60. Winch operator must pull up on DRIVER SIDE WINCH lever (Figure 10, Item 1) to pay out driver side winch cable (Figure 10, Item 7) until there is enough slack to relieve tension in cable. Release DRIVER SIDE WINCH lever. Check for twist in driver side winch cable.
61. With aid of an assistant, remove cotter pin (Figure 10, Item 11) and shouldered pin (Figure 10, Item 12), driver side winch clevis (Figure 10, Item 10), and shackle (Figure 10, Item 13) from Y-chain (Figure 10, Item 14).
62. Remove Y-chain (Figure 10, Item 14) from payload (Figure 10, Item 3).
63. Remove linch pin (Figure 10, Item 4) and keeper pin (Figure 10, Item 5) from snatch block (Figure 10, Item 6). Remove driver side winch cable (Figure 10, Item 7), close snatch block, reinstall keeper pin, and secure with linch pin.
64. Place snatch block (Figure 10, Item 6) in stowage position. Install stow clamp (Figure 10, Item 8) and secure by tightening clamp handle (Figure 10, Item 9).

65. Attach driver side winch clevis (Figure 10, Item 10) to upper left recovery eye (Figure 10, Item 2).

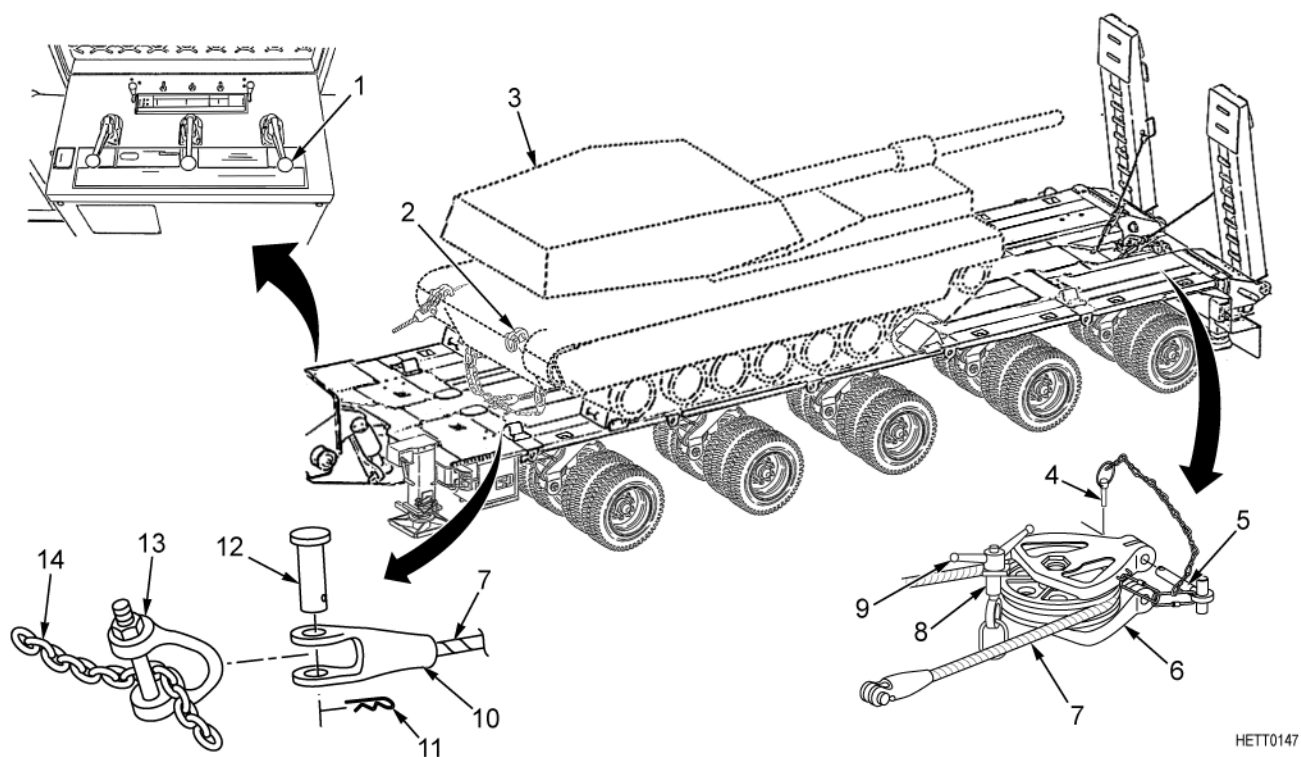


Figure 10. Dual Winch Unloading.

66. Remove driver side winch cable (Figure 11, Item 8) from gooseneck pivot pin sheave (Figure 11, Item 7).
67. Winch operator must push down on DRIVER SIDE WINCH lever (Figure 11, Item 2) to remove slack in cable (Figure 11, Item 8).
68. Lower both loading ramps (Figure 11, Item 5) (WP 0009).

NOTE

- Platform angle will be slightly greater than that normally used for load/off load.
- With Auxiliary Power Unit (APU) running, release semitrailer parking brakes and adjust platform height.

69. Raise front of semitrailer to 50 in. (127 cm) (top mark on crowbar) measured at No. 1 bogey position (WP 0008).
70. Lower rear of semitrailer until rear support legs are firmly in contact with ground. There must be at least 1 in. (2.54 cm) of polished (shiny) surface showing on rear suspension cylinders. Reapply semitrailer parking brakes (WP 0008).
71. Winch operator must pull up on both DRIVER SIDE WINCH lever (Figure 11, Item 2) and PASSENGER SIDE WINCH lever (Figure 11, Item 1) to pull payload (Figure 11, Item 3) slightly forward off of rear payload chocks (Figure 11, Item 4). Remove both rear payload chocks.

NOTE

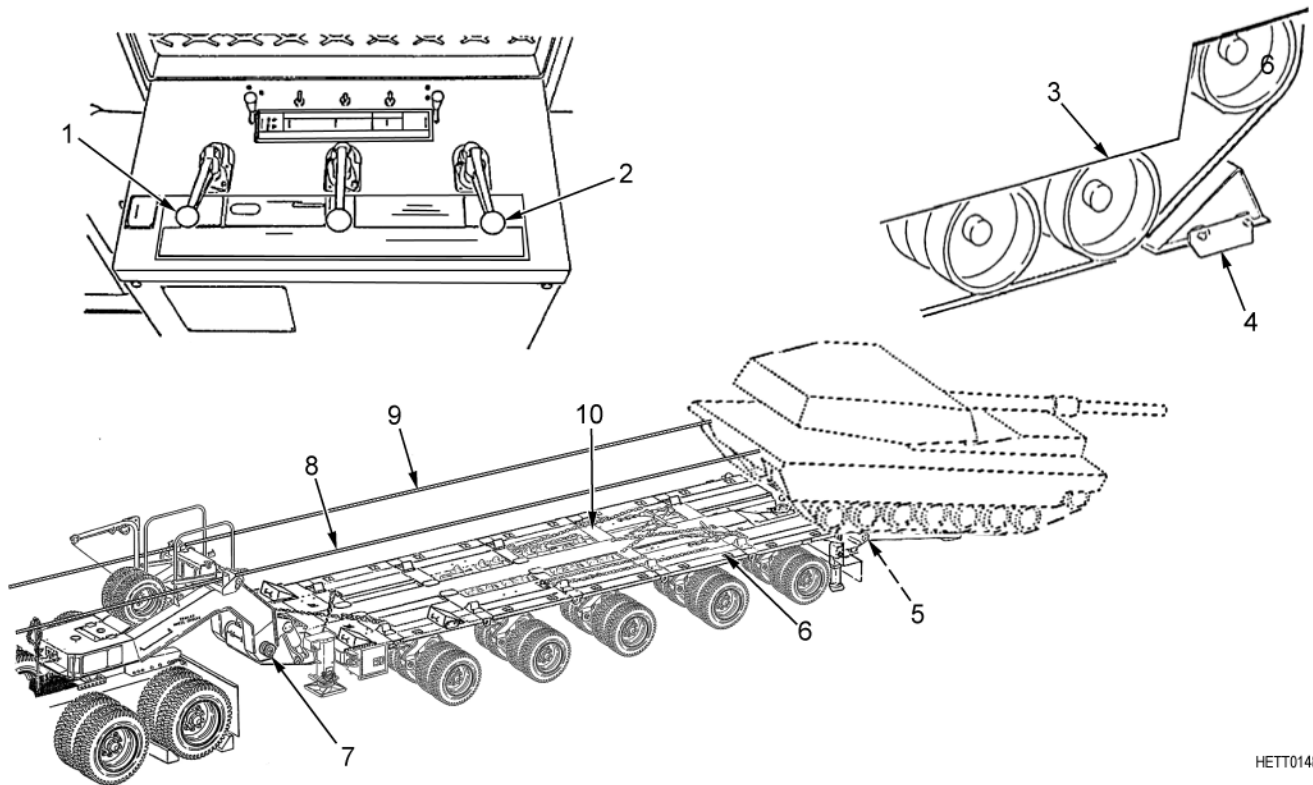
Before the payload will roll back on its own, it may be necessary to pull the first set of road wheels onto the front payload chocks.

72. Winch operator must push down on both DRIVER SIDE WINCH lever (Figure 11, Item 2) and PASSENGER SIDE WINCH lever (Figure 11, Item 1) and allow payload (Figure 11, Item 3) to roll off of platform (Figure 11, Item 6). Cables (Figure 11, Item 8 and Item 9) may be paid out unevenly to maintain directional control.
73. Once payload (Figure 11, Item 3) clears curb guides (Figure 11, Item 10), ensure that it rolls straight down ramps (Figure 11, Item 5).

WARNING

Prior to removing winch cable from the payload, winch operator must ensure the winch cables have enough slack to relieve tension in the cable. Failure to follow this warning may result in injury to personnel.

74. Winch operator must continue to pay out both winch cables (Figure 11, Item 8 and Item 9) until both are touching platform (Figure 11, Item 6). Release DRIVER SIDE WINCH lever (Figure 11, Item 1) and PASSENGER SIDE WINCH lever (Figure 11, Item 2).



HETT0148

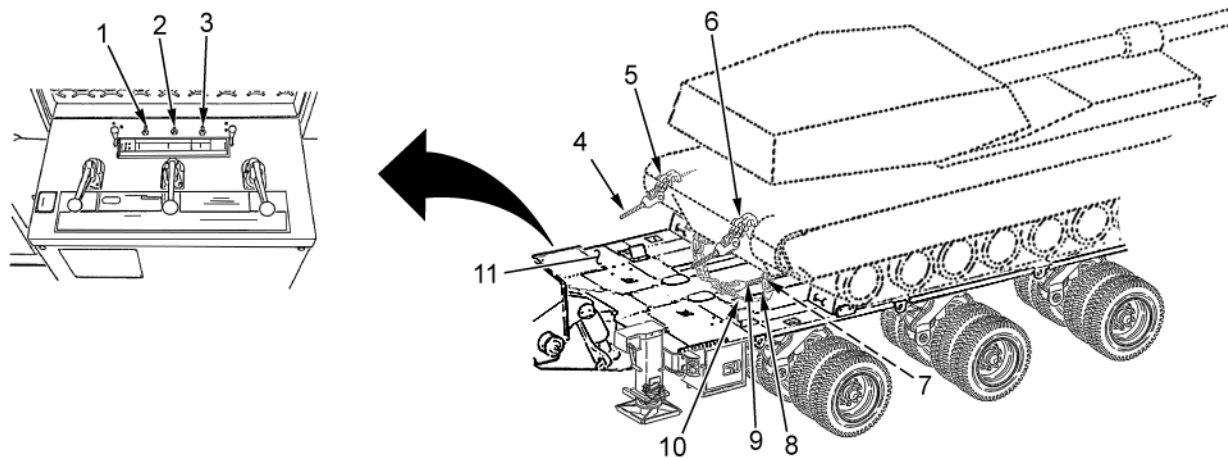
Figure 11. Dual Winch Unloading.

WARNING

Extreme caution must be used when removing the winch cables from payload. Cable may be under tension or may be twisted. If the winch cable has tension when removed, slowly and carefully, using both hands, rotate cable to relieve tension. DO NOT allow cable to twist or whip freely. Failure to follow this warning may result in injury to personnel.

75. Check for twist in passenger side winch cable (Figure 12, Item 4). Spotter must remove passenger side winch cable from upper recovery eye (Figure 12, Item 5) and lay passenger side winch cable on platform (Figure 12, Item 11).
76. Check for twists in driver side winch cable (Figure 12, Item 9). Spotter must remove driver side winch cable from upper recovery eye (Figure 12, Item 6) and lay driver side winch cable on platform (Figure 12, Item 11).
77. Remove Y-chain (Figure 12, Item 10) and two shackles (Figure 12, Item 8) from payload lower towing lugs (Figure 12, Item 7).

78. Push ENGINE SPEED CONTROL switch (Figure 12, Item 1) to HIGH ENGINE IDLE. Momentarily push ENGINE SPEED LOCK CONTROL switch (Figure 12, Item 2) to lock engine speed at high idle (approximately 1,500 rpm), and then release ENGINE SPEED CONTROL switch. Push WINCH SPEED CONTROL SWITCH (Figure 12, Item 3) to HIGH.



HETT0149

Figure 12. Dual Winch Unloading.

79. Remove driver side winch cable (Figure 13, Item 9) from gooseneck cable guide (Figure 13, Item 11). Leave driver side winch cable on platform (Figure 13, Item 8).
80. Remove passenger side winch cable (Figure 13, Item 10) from gooseneck cable guide (Figure 13, Item 11). Leave passenger side winch cable on platform (Figure 13, Item 8).

WARNING



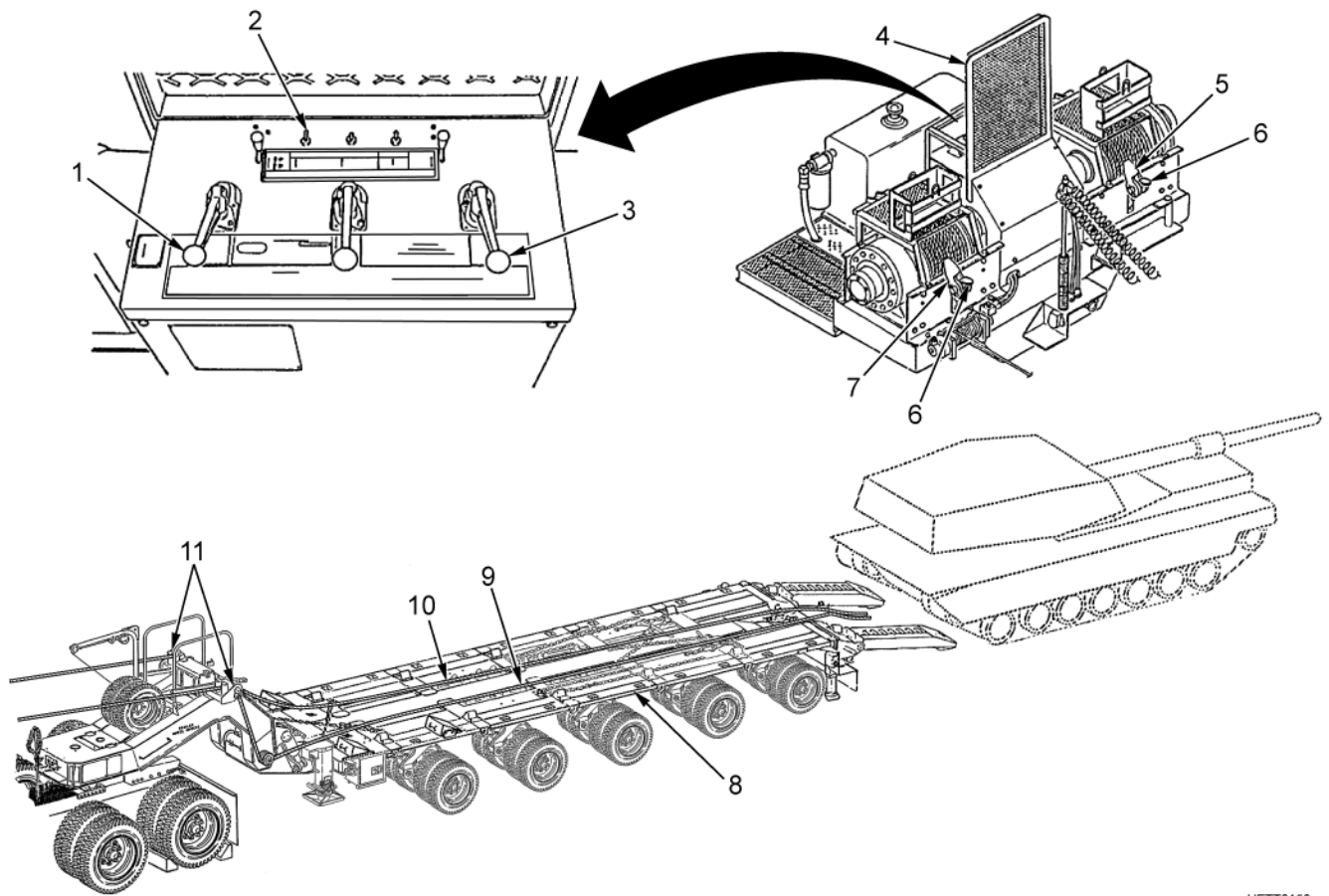
DO NOT allow hands to get between clevis and winch. Failure to follow this warning may result in injury to personnel.

81. With aid of an assistant, use one person to push down on DRIVER SIDE WINCH lever (Figure 13, Item 3) and one person to maintain tension on driver side winch cable (Figure 13, Item 9). Retract and stow winch cable clevis (Figure 13, Item 7) onto stow hook (Figure 13, Item 6). Release DRIVER SIDE WINCH lever.
82. Using an assistant to push down on PASSENGER SIDE WINCH lever (Figure 13, Item 1) and an assistant to maintain tension on passenger side winch cable (Figure 13, Item 10), retract and stow winch cable clevis (Figure 13, Item 5) onto stow hook (Figure 13, Item 6). Release PASSENGER SIDE WINCH lever.
83. Pull ENGINE SPEED CONTROL switch (Figure 13, Item 2) to LOW ENGINE IDLE. Lower guard (Figure 13, Item 4) and lock in place.

NOTE

Remove all chains and load binders from platform and restow in platform storage compartment.

84. Perform steps 33 through 45 of Unloading Able Payloads (WP 0016) to stow equipment used during this procedure and prepare tractor and semitrailer for transport.



HETT0150

Figure 13. Dual Winch Unloading.

END OF TASK

DUAL WINCH UNLOADING FOR FREE-ROLLING PAYLOAD**NOTE**

To unload a disabled payload that rolls freely, proceed as follows.

1. Perform steps 1 through 8 of Unloading Able Payloads (WP 0016) to position tractor/semitrailer, adjust ramp span width, and position curb guides.

WARNING

- Provide ample clear space behind the disabled payload during unloading, if possible, to protect personnel and prevent damage to equipment if cables should break while payload is being unloaded.
- Ensure all ground personnel stand clear of winch cables except when handling or injury to personnel may result.
- Use extreme caution during any operation on a slope.
- Ensure winch cables are not kinked, clevises are secure to winch cables, and snatch blocks and shackles are in good condition and properly secured or injury to personnel may result.
- Ensure winch cables are inspected in accordance with TB 43-0142 or injury to personnel may result.

Failure to follow these warnings may result in injury to personnel.

WARNING

- Ensure ground spotter stands off curbside of semitrailer and maintains visual contact with the winch operator. The spotter must observe cables, snatch blocks, shackles, and payload position during unloading or injury to personnel may result.
- DO NOT overload tractor winches. Know the rating of the winches being used and any protection devices (such as shear pins) or injury to personnel may result.
- DO NOT at any time during unloading operations, while the payload is being pulled off with winches, allow personnel be on the semitrailer platform or injury to personnel may result.
- Always wear leather gloves when handling cable. Never allow cable to run through hands.

Failure to follow these warnings may result in injury to personnel.

NOTE

Ensure the M1070 tractor parking brake is applied. The Power Take Off (PTO) will not engage unless the tractor parking brake is set.

2. Turn beacon light switch (Figure 14, Item 1) to ON position. With engine idling, set PTO switch (Figure 14, Item 2) to ON.
3. Perform steps 9 through 21 of Unloading Able Payloads (WP 0016) to disconnect all rear tiedown chains from payload.

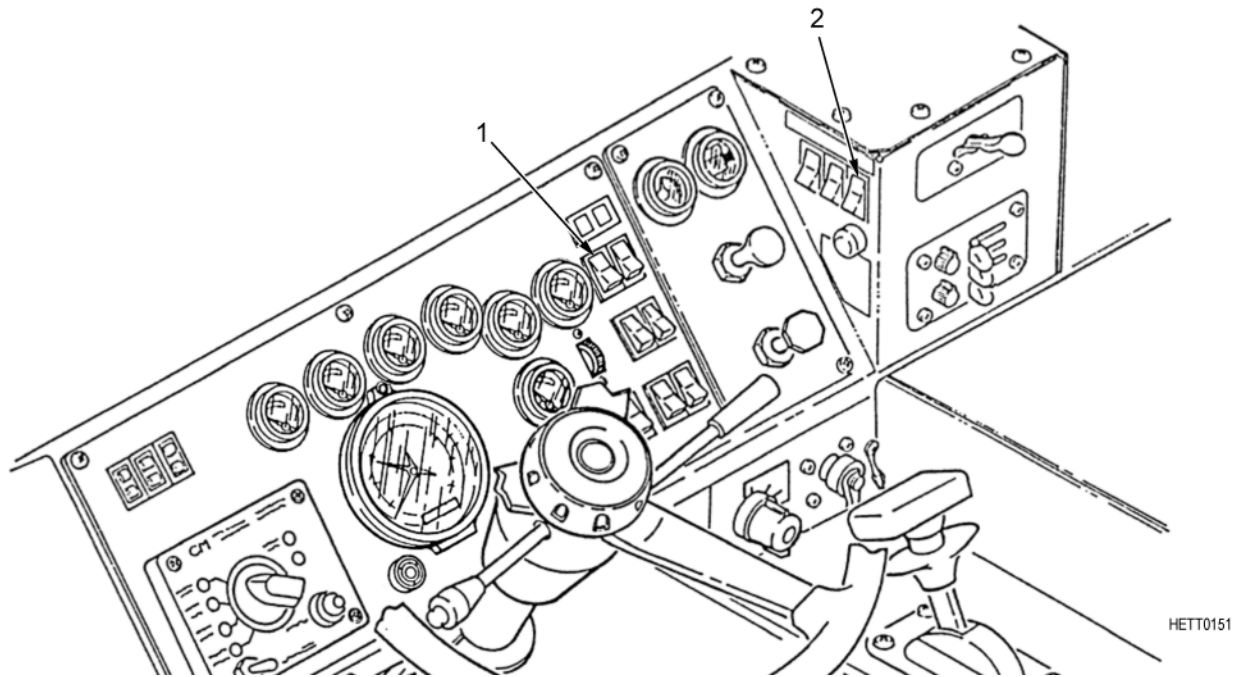


Figure 14. Dual Winch Unloading.

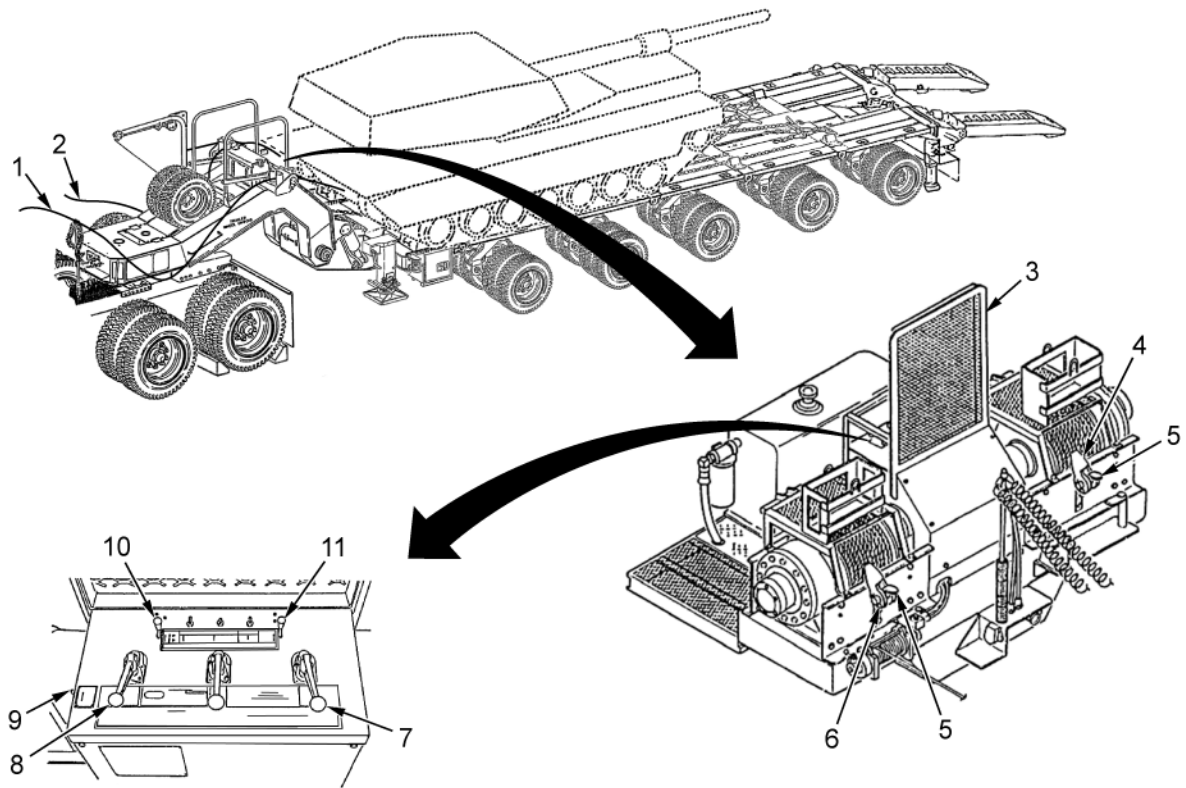
WARNING

Hearing protection must be worn when near winching station or operating winches. Failure to follow this warning may result in injury to personnel.

NOTE

The guard is shown in the upright position.

4. Raise guard (Figure 15, Item 3) and lock in upright position.
5. Ensure both DRIVER SIDE WINCH KICKOUT (Figure 15, Item 11) and PASSENGER SIDE WINCH KICKOUT (Figure 15, Item 10) switches are ENGAGED (pushed away from operator).
6. Ensure CABLE HOLD-DOWN lever (Figure 15, Item 9) is ON (pushed away from operator).
7. Pull DRIVER SIDE WINCH lever (Figure 15, Item 7) upward momentarily until there is enough slack in driver side winch cable (Figure 15, Item 1) to be removed from stow hook (Figure 15, Item 5). Remove driver side winch cable clevis (Figure 15, Item 6) from stow hook to unstow driver side winch cable. Continue paying out driver side winch cable until spotter on the ground can reach driver side clevis. Release DRIVER SIDE WINCH lever.
8. Pull PASSENGER SIDE WINCH lever (Figure 15, Item 8) upward momentarily until there is enough slack in passenger side winch cable (Figure 15, Item 2) to be removed from stow hook (Figure 15, Item 5). Remove passenger side winch cable clevis (Figure 15, Item 4) from stow hook to unstow passenger side winch cable. Continue paying out passenger side winch cable until spotter on the ground can reach clevis. Release PASSENGER SIDE WINCH lever.

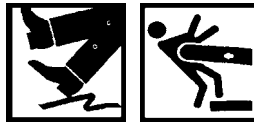


HETT0152

Figure 15. Dual Winch Unloading.

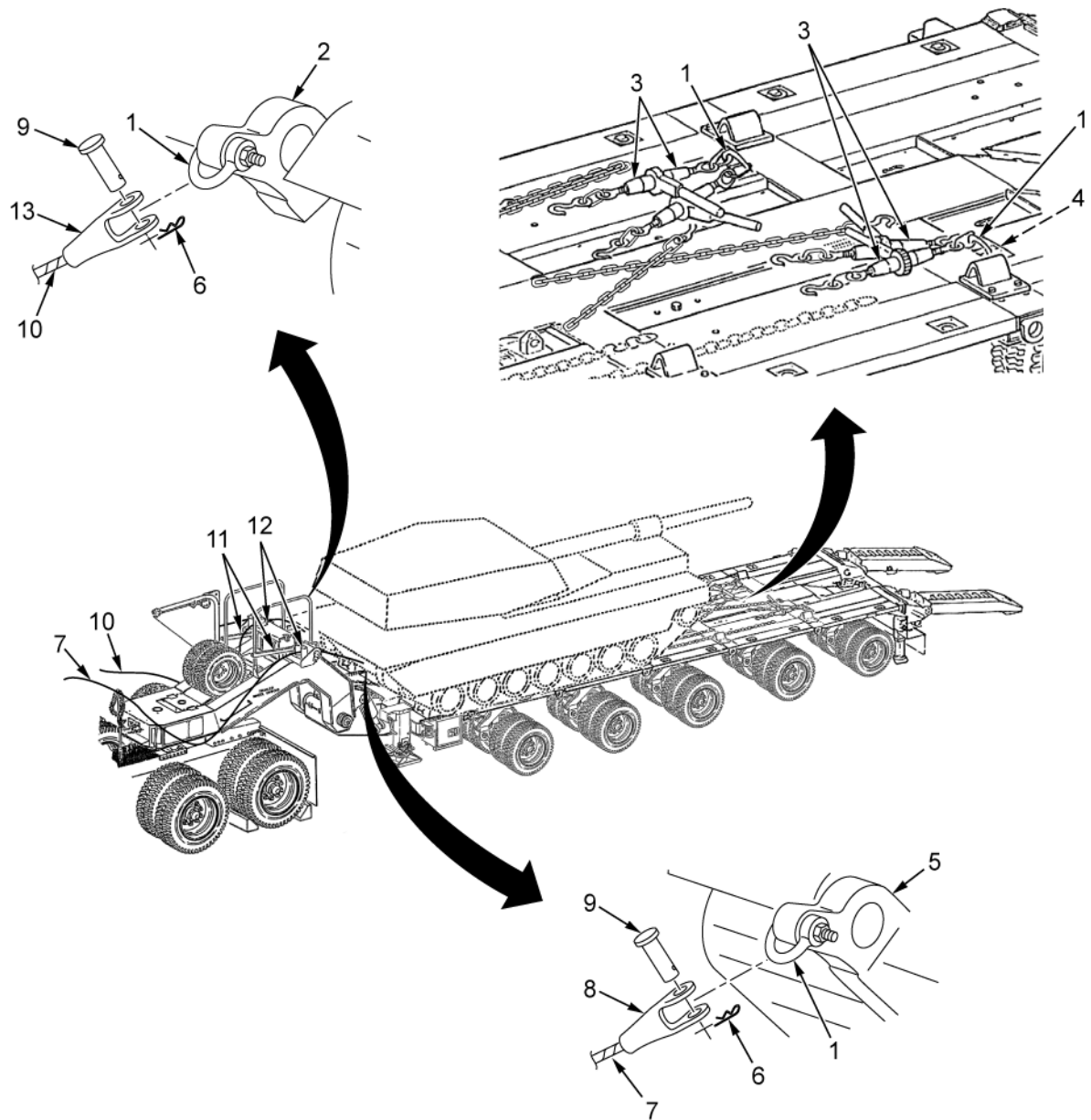
9. Remove cotter pin (Figure 16, Item 6) and shouldered pin (Figure 16, Item 9) from clevis (Figure 16, Item 8) on driver side winch cable (Figure 16, Item 7).
10. Remove cotter pin (Figure 16, Item 6) and shouldered pin (Figure 16, Item 9) from clevis (Figure 16, Item 13) on passenger side winch cable (Figure 16, Item 10).
11. Remove two large shackles (Figure 16, Item 1) from four load binders (Figure 16, Item 3) and rear payload tiedown ring (Figure 16, Item 4).

WARNING



Extend gooseneck safety rail while attaching or removing payload winch cable. Failure to extend safety rail while attaching or removing payload winch cable may cause injury to personnel.

12. Unlatch and extend gooseneck safety rail (Figure 16, Item 11).
13. Install one large shackle (Figure 16, Item 1) to upper right recovery eye (Figure 16, Item 5) and upper left recovery eye (Figure 16, Item 2).
14. Pull out passenger side winch cable (Figure 16, Item 10) and attach clevis (Figure 16, Item 13) to shackle (Figure 16, Item 1) on payload upper left recovery eye (Figure 16, Item 2). Secure winch cable clevis by installing shouldered pin (Figure 16, Item 9) and cotter pin (Figure 16, Item 6).
15. Pull out driver side winch cable (Figure 16, Item 7) and attach clevis (Figure 16, Item 8) to shackle (Figure 16, Item 1) on payload upper right recovery eye (Figure 16, Item 2). Secure winch cable clevis by installing shouldered pin (Figure 16, Item 9) and cotter pin (Figure 16, Item 6).
16. Route both cables (Figure 16, Item 7 and Item 10) through gooseneck cable guides (Figure 16, Item 12). Remove slack from cables.



HETT0802

Figure 16. Dual Winch Unloading.

CAUTION

Failure to retract and latch gooseneck safety rail before operating tractor/trailer will result in damage to equipment.

17. Retract and latch gooseneck safety rail (Figure 17, Item 13).
18. Perform steps 43 through 51 of Loading Able Payloads (WP 0015) to adjust platform height, adjust and lower ramps, and position remaining curb guides.

NOTE

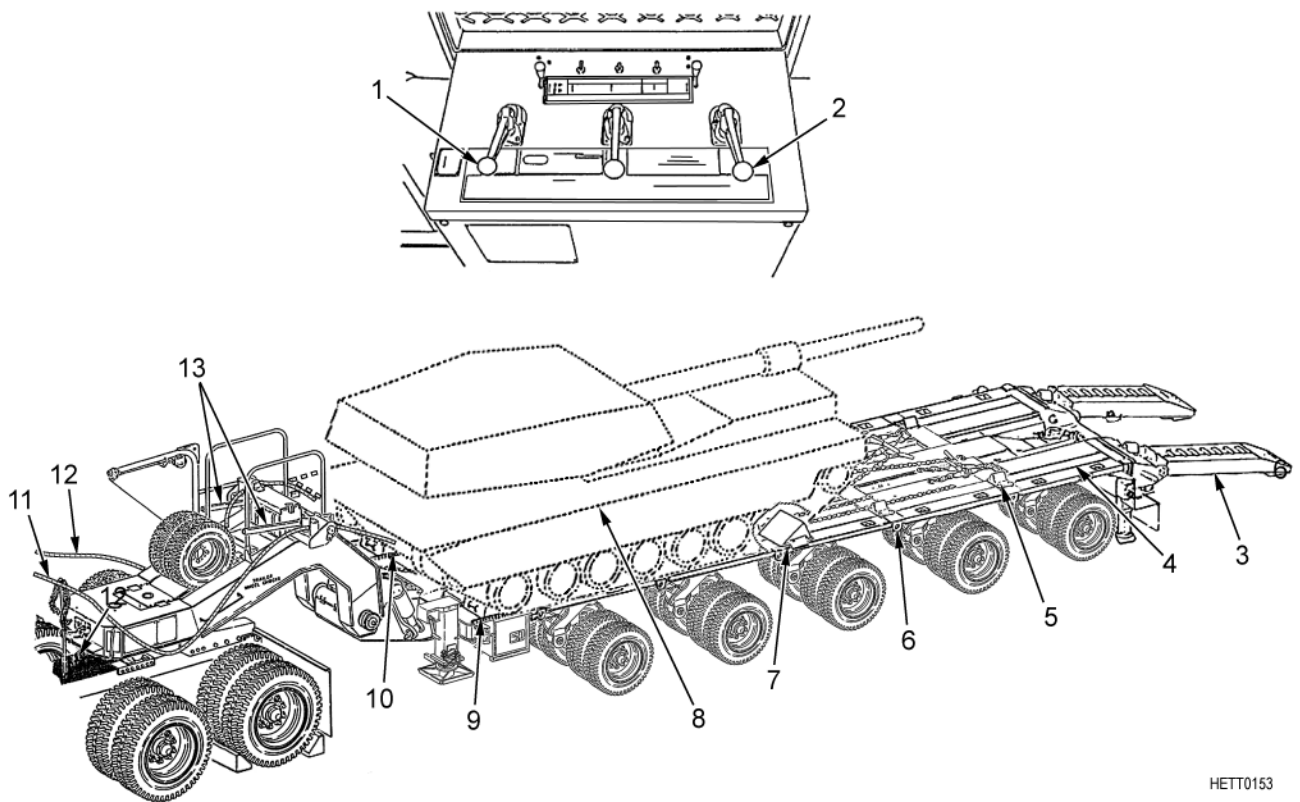
With winches in low speed, winch operator must push down on both DRIVER SIDE WINCH lever and PASSENGER SIDE WINCH lever to move payload slightly forward and reduce pressure on rear payload chocks.

19. Release DRIVER SIDE WINCH lever (Figure 17, Item 1) and PASSENGER SIDE WINCH lever (Figure 17, Item 2). Using crowbar, if necessary, remove both rear payload chocks (Figure 17, Item 9) and position just in front of No. 4 bogie (Figure 17, Item 6).
20. Winch operator must pull up on DRIVER SIDE WINCH lever (Figure 17, Item 1) and PASSENGER SIDE WINCH lever (Figure 17, Item 2) to allow payload (Figure 17, Item 8) to roll back until firmly in contact with rear payload chocks (Figure 17, Item 7). Release both DRIVER SIDE and PASSENGER SIDE WINCH levers.
21. Disconnect front tiedown chains (Figure 17, Item 10) from payload (Figure 17, Item 8).
22. Winch operator must push down both DRIVER SIDE WINCH lever (Figure 17, Item 2) and PASSENGER SIDE WINCH lever (Figure 17, Item 1) to pull payload (Figure 17, Item 8) slightly forward off of rear payload chocks (Figure 17, Item 7). Remove rear payload chocks.
23. Winch operator must pull up on both DRIVER SIDE WINCH lever (Figure 17, Item 2) and PASSENGER SIDE WINCH lever (Figure 17, Item 1) to evenly pay out cables (Figure 17, Item 12 and Item 11) and allow payload (Figure 17, Item 8) to roll off of semitrailer (Figure 17, Item 4).
24. Once payload (Figure 17, Item 8) clears curb guides (Figure 17, Item 5), ensure that it rolls straight down ramps (Figure 17, Item 3). Pay out cables (Figure 17, Item 12 and Item 11) unevenly, if necessary, for directional control.

WARNING

Prior to removing winch cable from payload, winch operator must ensure the winch cables have enough slack to relieve tension in the cable. Failure to follow this warning may result in injury to personnel.

25. Winch operator must continue to pay out both driver side winch cable (Figure 17, Item 12) and passenger side winch cable (Figure 17, Item 11) until cables are touching platform (Figure 17, Item 4). Release DRIVER SIDE WINCH lever and PASSENGER SIDE WINCH lever.



HETT0153

Figure 17. Dual Winch Unloading.

WARNING

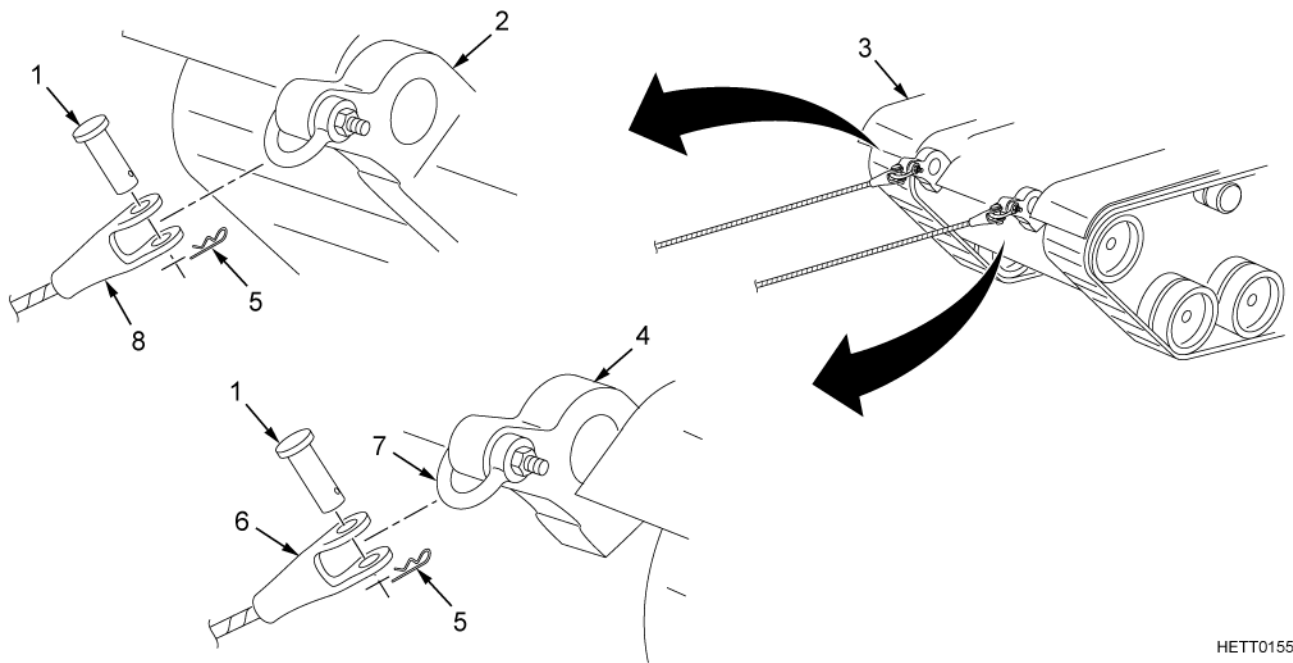
- Extreme caution must be used when removing winch cables from payload. Cable may be under tension or may be twisted.
- If winch cable has tension when removed, slowly and carefully, using both hands, rotate cable to relieve tension. DO NOT allow cable to twist or whip freely.

Failure to follow these warnings may result in injury to personnel.

NOTE

Check for twist in both winch cables.

26. Remove cotter pins (Figure 18, Item 5) and shouldered pins (Figure 18, Item 1) from both driver side winch cable clevis (Figure 18, Item 6) and passenger side winch cable clevis (Figure 18, Item 8). Remove cable clevises from shackles (Figure 18, Item 7) on both upper recovery eyes (Figure 18, Item 2 and Item 4) on payload (Figure 18, Item 3).



HETT0155

Figure 18. Dual Winch Unloading.

27. Push ENGINE SPEED CONTROL switch (Figure 19, Item 1) to HIGH ENGINE IDLE. Momentarily push ENGINE SPEED LOCK switch (Figure 19, Item 2) to lock engine speed at high idle (approximately 1,500 rpm), and then release ENGINE SPEED LOCK switch. Push WINCH SPEED CONTROL switch (Figure 19, Item 3) to HIGH.
28. Remove driver side winch cable (Figure 19, Item 11) from gooseneck cable guide (Figure 19, Item 12). Leave cable on platform (Figure 19, Item 9).
29. Remove passenger side winch cable (Figure 19, Item 10) from gooseneck cable guide (Figure 19, Item 12). Leave cable on platform (Figure 19, Item 9).

WARNING



DO NOT allow hands to get between clevis and winch or injury to personnel may result. Failure to follow this warning may result in injury to personnel.

30. With aid of an assistant, use one person to push down on DRIVER SIDE WINCH lever (Figure 19, Item 4) and one person to maintain tension on driver side winch cable (Figure 19, Item 11). Retract and stow winch cable clevis (Figure 19, Item 8) onto stow hook (Figure 19, Item 7). Release DRIVER SIDE WINCH lever.
31. With aid of an assistant, use one person to push down on PASSENGER SIDE WINCH lever (Figure 19, Item 13) and one person to maintain tension on passenger side winch cable (Figure 19, Item 10). Retract and stow winch cable clevis (Figure 19, Item 6) onto stow hook (Figure 19, Item 7). Release PASSENGER SIDE WINCH lever.

NOTE

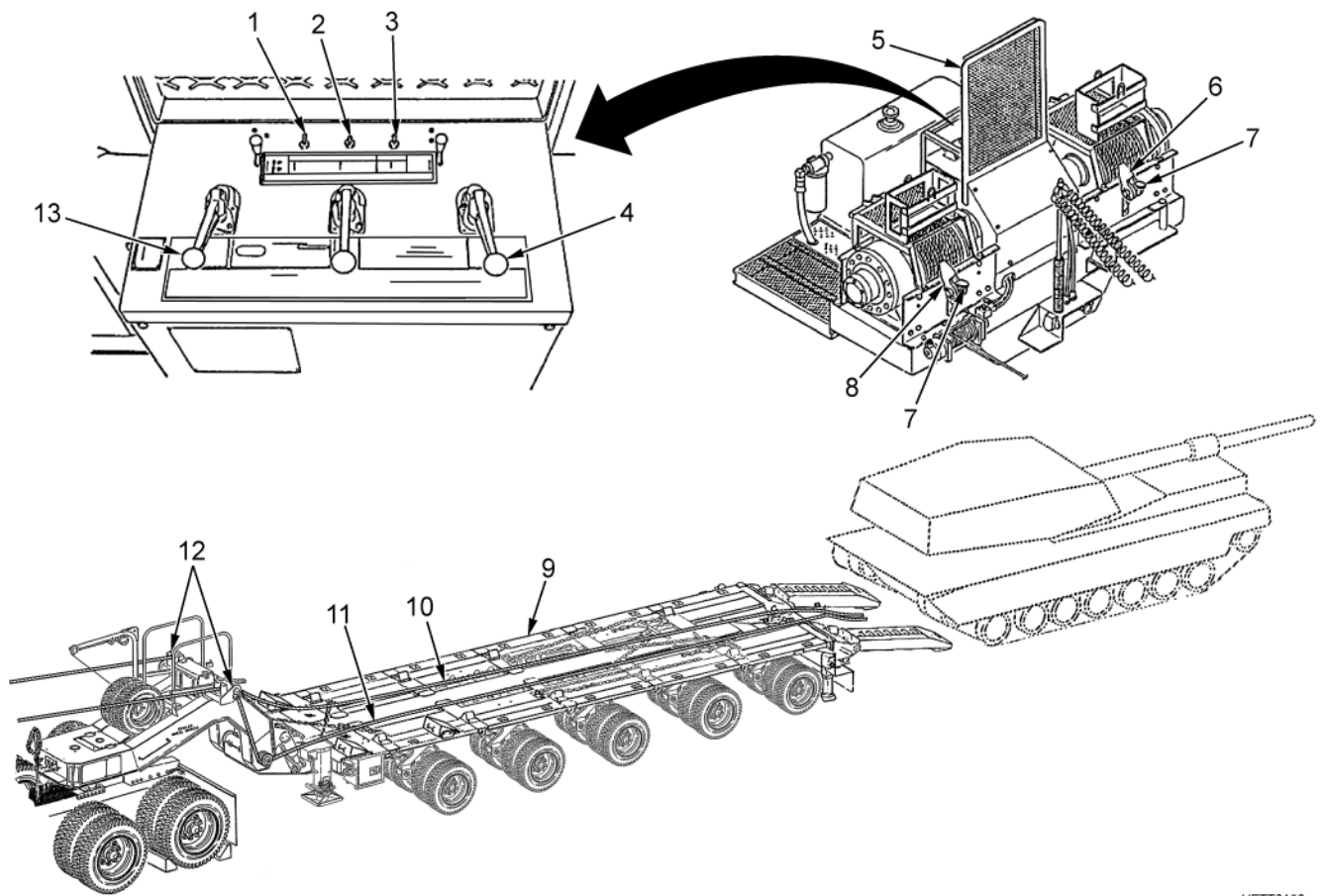
The guard is shown in the raised position.

32. Pull ENGINE SPEED CONTROL switch (Figure 19, Item 1) to LOW ENGINE IDLE. Lower guard (Figure 19, Item 5) and lock guard in place.

NOTE

Remove all chains and load binders from platform and restow in platform storage compartment.

33. Perform steps 33 through 45 of Unloading Able Payloads (WP 0016) to stow equipment used during this procedure and prepare tractor and semitrailer for transport.



HETT0156

Figure 19. Dual Winch Unloading.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**OPERATION UNDER UNUSUAL CONDITIONS - FORDING**

INITIAL SETUP:**Personnel Required****1**

GENERAL INFORMATION

This work package contains instructions for fording the Heavy Equipment Transporter (HET) semitrailer.

FORDING

WARNING

- **DO NOT** enter water at more than walking speed of 5 mph (8 kph) with an entrance or exit slope of more than 15 percent.
- **DO NOT** enter water deeper than 28 in. (71 cm) including wave height.
- **DO NOT** enter water that has ice or debris on surface.
- Always check the stream bottom to determine that it is firm enough to support the semitrailer and that there are no obstacles under water.
- **DO NOT** enter water that has a current velocity of more than 5 mph (8 kph). This is equivalent to 7 ft/s (2 m/s).
- The M1000 is not Nuclear, Biological, and Chemical (NBC) survivable because of the large number of components and materials that are either non-decontaminable or lack sufficient hardness to survive conventional decontamination procedures. Such materials include rubber tires, hoses, mud flaps, and latches; polyester and urethane foams used for insulation; uncovered auxiliary power unit; hydraulic system components; electrical wiring harness; and lubricants. These materials will absorb and desorb agents that present a contact and vapor hazard. The integrity of these materials will also be reduced when exposed to certain agents and decontaminates.

Failure to follow these warnings may result in injury to personnel or damage to equipment.

CAUTION

If tractor/semitrailer combination becomes mired (stuck) in mud or soft sand, recovery must be achieved by pulling forward. If the combination is pulled rearward, from the rear of the semitrailer, the bogies will tend to dig in deeper, and severe damage to equipment may result.

NOTE

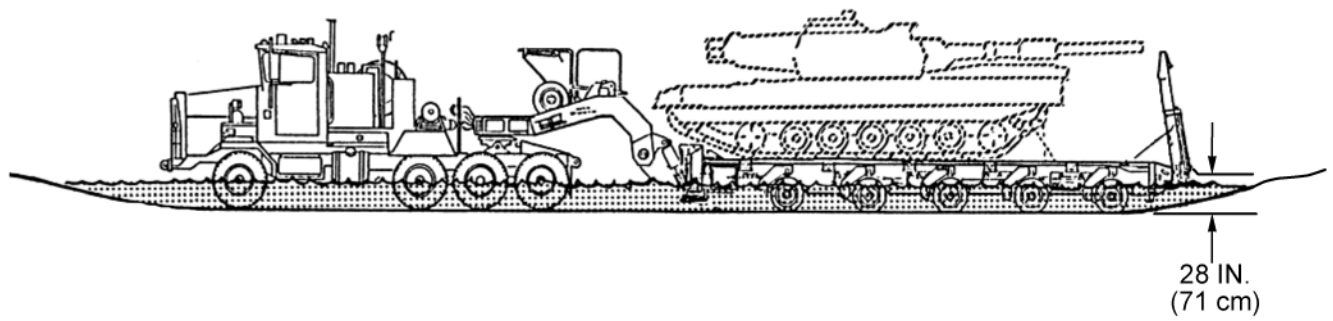
- If tractor becomes mired (stuck) while the semitrailer is still on solid surface, recovery may be achieved by pulling rearward, from the rear of the semitrailer, using a recovery vehicle.
- No special preparation of semitrailer is required prior to fording.

1. Check both entry and exit slopes for maximum angles of 15 percent. Check both slopes for excessive or high break-overs.
2. Check bottom of stream to be sure that it is firm enough to support semitrailer and is free of underwater obstacles.
3. Enter water as perpendicular to stream as possible.
4. Keep tractor/semitrailer combination in as straight a line as possible.
5. Maintain even speed.
6. Exit stream as perpendicular to stream as possible.

NOTE

No special maintenance of semitrailer is required after fording; however, suspension and steering components should be scheduled for lubrication as soon as practical.

7. When clear of stream and on level terrain, make several gradual stops to clear water from brakes and to ensure brakes work properly.



HETT0157

Figure 1. Fording.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**OPERATION UNDER UNUSUAL CONDITIONS - AUXILIARY POWER UNIT (APU) JUMP START****INITIAL SETUP:****References**

WP 0005
TM 9-2320-360-10

Personnel Required

1

GENERAL INFORMATION

This work package contains instructions for jump starting the Auxiliary Power Unit (APU) of the Heavy Equipment Transporter (HET) semitrailer.

AUXILIARY POWER UNIT (APU) JUMP START

1. When the APU battery has been discharged to a point where it cannot start the APU, perform steps 1 through 5 of APU Startup and Shutdown (WP 0005) to ensure that APU is ready to be started.
2. If tractor is coupled to semitrailer, start tractor engine and open battery box (TM 9-2320-360-10).
3. If tractor and semitrailer are not coupled, position tractor near gooseneck so that tractor batteries are approximately 15 to 20 ft (4.5 to 6.0 m) from APU jump start cable stowage bag (Figure 1, Item 1).

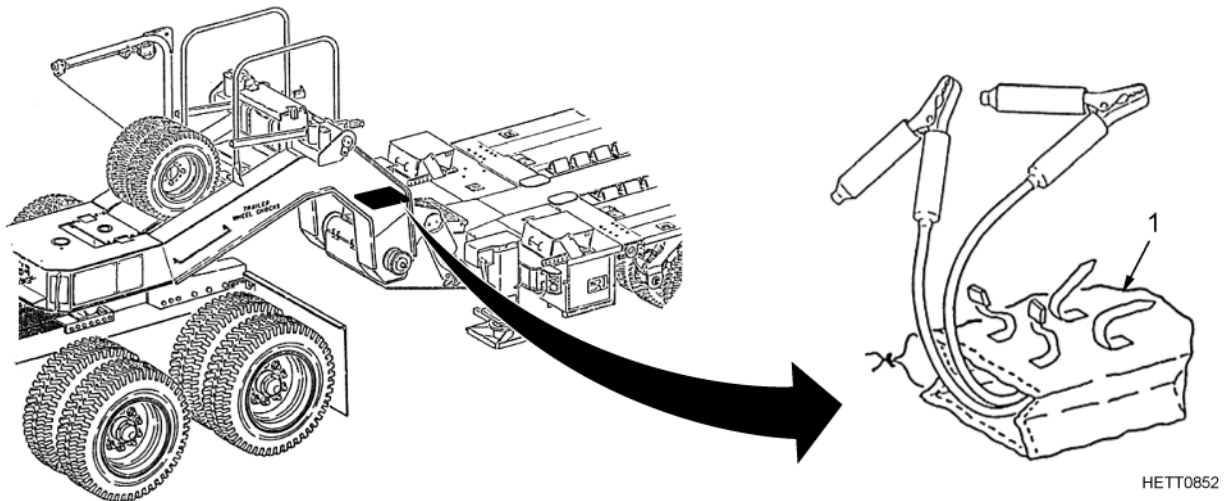
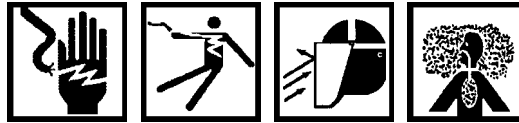


Figure 1. APU Jump Start Cable Stowage Bag.

WARNING



- Remove all jewelry such as rings, dog tags, bracelets, etc., when jump starting the APU. Wearing jewelry may result in an electrical shock and/or serious injury or death to personnel.
- The stowage batteries give off a hydrogen gas, which is extremely explosive. Keep all open flames, sparks, and smoking materials away from the batteries while connecting the cables for the jump start.

Failure to follow these warnings may result in injury to personnel.

4. Keep tractor engine running and open tractor battery box (TM 9-2320-360-10).

CAUTION

Some semitrailers have solar battery charger leads connected to the negative and positive terminals. Ensure these leads are not damaged when disconnecting the terminals from the battery posts.

5. Disconnect negative (-) cable (Figure 2, Item 1) from negative pole of APU battery (Figure 2, Item 2).

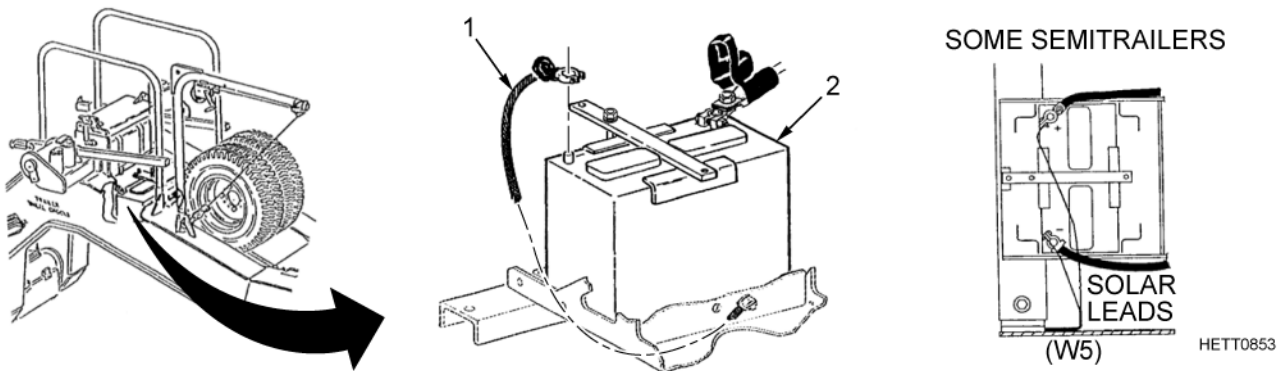
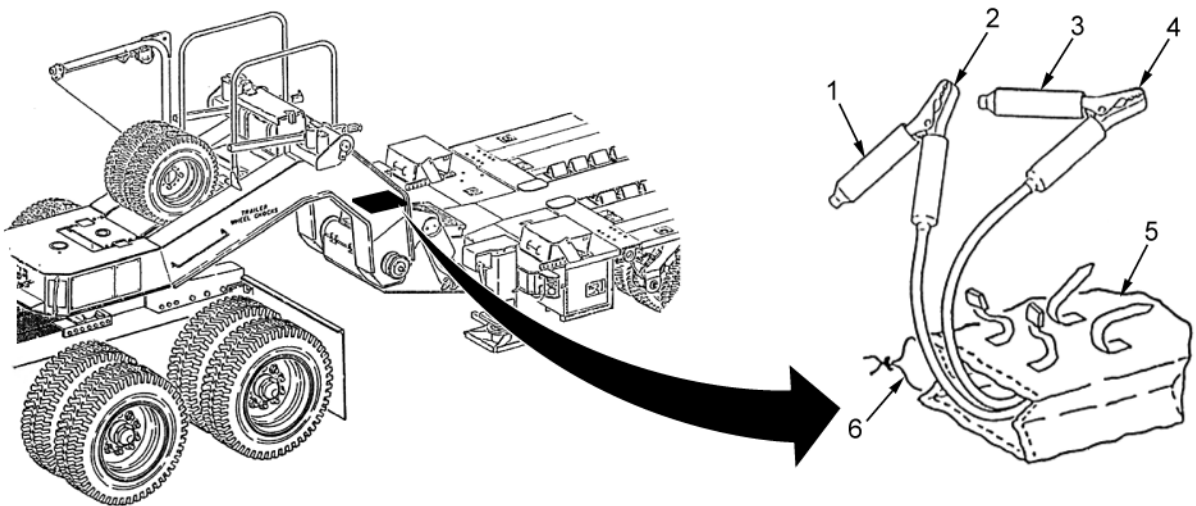


Figure 2. APU Negative Battery Cable.

6. Loosen drawstring (Figure 3, Item 6) of cable stowage bag (Figure 3, Item 5) and pull out two jumper cables (Figure 3, Item 4 and Item 2).
7. The negative (-) cable (Figure 3, Item 2) is approximately 9 ft (2.75 m) in length and has a black clamp (Figure 3, Item 1) on its end.
8. The positive (+) cable (Figure 3, Item 4) is approximately 28 ft (8.5 m) in length and has a red clamp (Figure 3, Item 3) on its end.



HETT0158

Figure 3. APU Jumper Cables.

NOTE

The tractor operates on 12-VDC and 24-VDC systems. Two of the tractor batteries are connected in a series for the 24-VDC requirements, and two of the tractor batteries are connected in parallel for the 12-VDC requirements. The APU electrical system requires only 12-VDC. The jump start system electrical box will not permit more than 12-VDC to be applied to the APU. The positive (red) clamp of the APU jumper cable must only be connected to a 12-VDC output.

9. Connect positive (red) clamp (Figure 4, Item 8) of cable (Figure 4, Item 6) to positive (+) terminal (Figure 4, Item 9) on either of tractor batteries (Figure 4, Item 7) that have their positive terminal (+) connected together (parallel connections).
10. Connect negative (black) clamp (Figure 4, Item 12) of cable (Figure 4, Item 5) to tractor frame (Figure 4, Item 11) and ensure connection is good.

NOTE

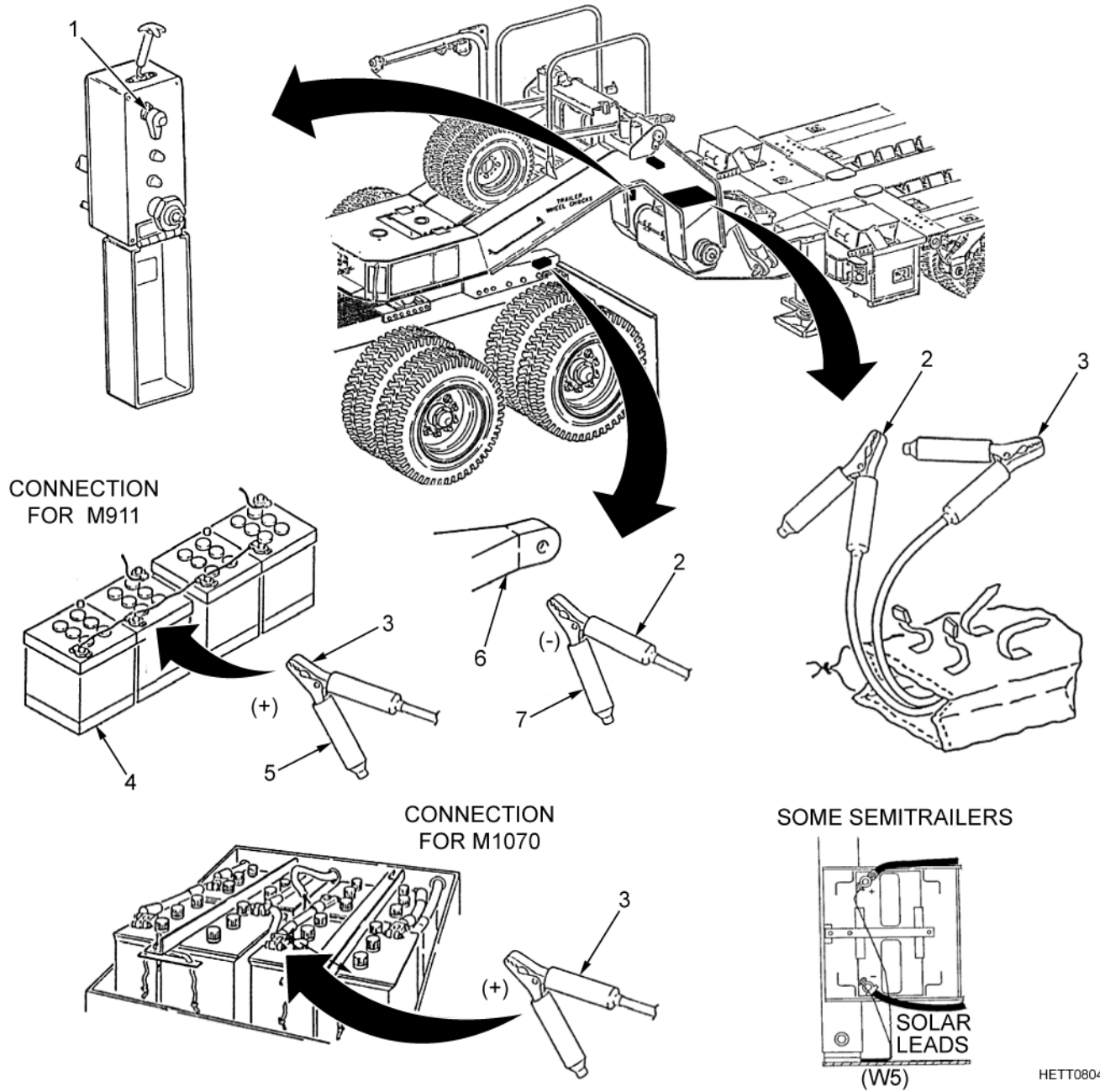
If the system is installed incorrectly or the jumper cables receive improper voltage, the solenoid will not engage, and the APU starter will not function.

11. Press switch (Figure 4, Item 4) on electrical box (Figure 4, Item 3) and listen for an audible click, which will be heard as solenoid is engaged.
12. Open cover (Figure 4, Item 10) on APU control box (Figure 4, Item 1).
13. Press and pull throttle control knob (Figure 4, Item 2) full outboard.

WARNING

Hearing protection is required within 10 ft (3 m) of the APU when the APU is running. Failure to follow this warning may result in injury to personnel.

14. Turn APU control box START switch (Figure 5, Item 1) clockwise momentarily to see if starter will crank.
15. If starter cranks, immediately rotate START switch (Figure 5, Item 1) to OFF position and perform steps 8 through 15 of APU Startup and Shutdown (WP 0005).
16. If starter does not crank, rotate START switch (Figure 5, Item 1) to OFF position and check jumper cables (Figure 5, Item 2 and Item 3) for proper connection.
17. After checking connections, repeat steps 11 through 16 above.
18. After APU starts, disconnect negative (black) clamp (Figure 5, Item 7) on cable (Figure 5, Item 2) from tractor frame (Figure 5, Item 6), and disconnect positive (red) clamp (Figure 5, Item 5) on cable (Figure 5, Item 3) from tractor batteries (Figure 5, Item 4).



HETT0804

Figure 5. APU Jump Start.

19. Reconnect negative cable (Figure 6, Item 1) to negative (-) pole of APU battery (Figure 6, Item 2).

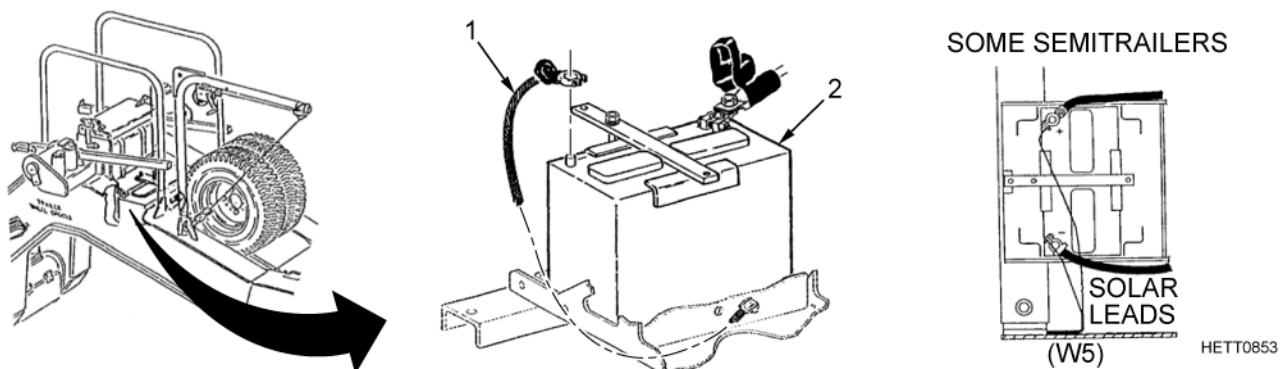


Figure 6. APU Jump Start.

20. Close battery box on tractor (TM 9-2320-360-10).

21. Coil cables (Figure 7, Item 1 and Item 2) and stow in stowage bag (Figure 7, Item 3).

22. Tighten drawstring (Figure 7, Item 4) on stowage bag (Figure 7, Item 3).

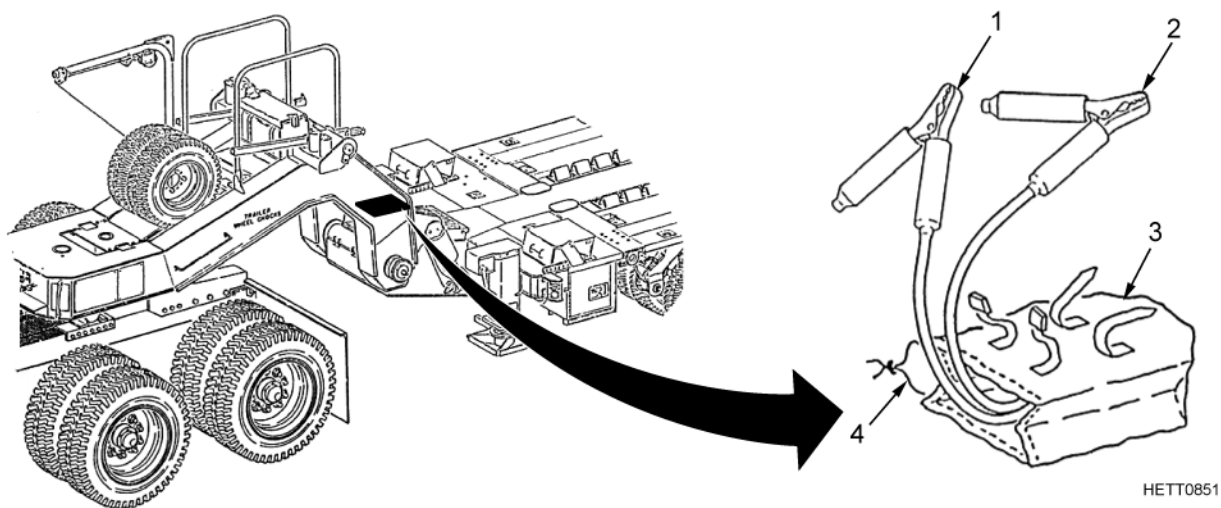


Figure 7. APU Jump Start.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**OPERATION UNDER UNUSUAL CONDITIONS - ARCTIC WEATHER AUXILIARY POWER UNIT (APU)
STARTING**

INITIAL SETUP:**Personnel Required**

2

References

WP 0020

WP 0035

GENERAL INFORMATION

This work package contains instructions for starting the Auxiliary Power Unit (APU) of the Heavy Equipment Transporter (HET) semitrailer in arctic weather conditions.

ARCTIC WEATHER AUXILIARY POWER UNIT (APU) STARTING**NOTE**

- The following procedure is a timed sequence of events necessary to start the Auxiliary Power Unit (APU) in arctic weather conditions. Read this procedure and strictly adhere to the steps, or starting may be more difficult due to loss of time and exposure to cold temperatures.
- APU arctic starting is accomplished in two methods. The first method of starting without using swing-fire heater can be accomplished from 0 to -25°F (-18 to -31°C). The second method of starting can be accomplished from -25 to -50°F (-31 to -46°C). The use of the swing-fire heater, if available, is addressed in this procedure.

1. Perform steps 2 through 11 of APU Jump Start (WP 0020) to connect APU jump start system.

CAUTION

The hydraulic tank oil valve must be open prior to starting the APU or severe damage to the hydraulic pump may result.

NOTE

- Gain access to the APU (WP 0035) from the rear of the gooseneck.
- The hydraulic tank oil valve handle is shown in the closed position.
- Prepare the APU for arctic starting as follows.

2. Open hydraulic tank oil valve handle (Figure 1, Item 1).

NOTE

The fuel tank petcock is shown in the OPEN position.

3. Check that fuel petcock (Figure 1, Item 2) is in OPEN position.

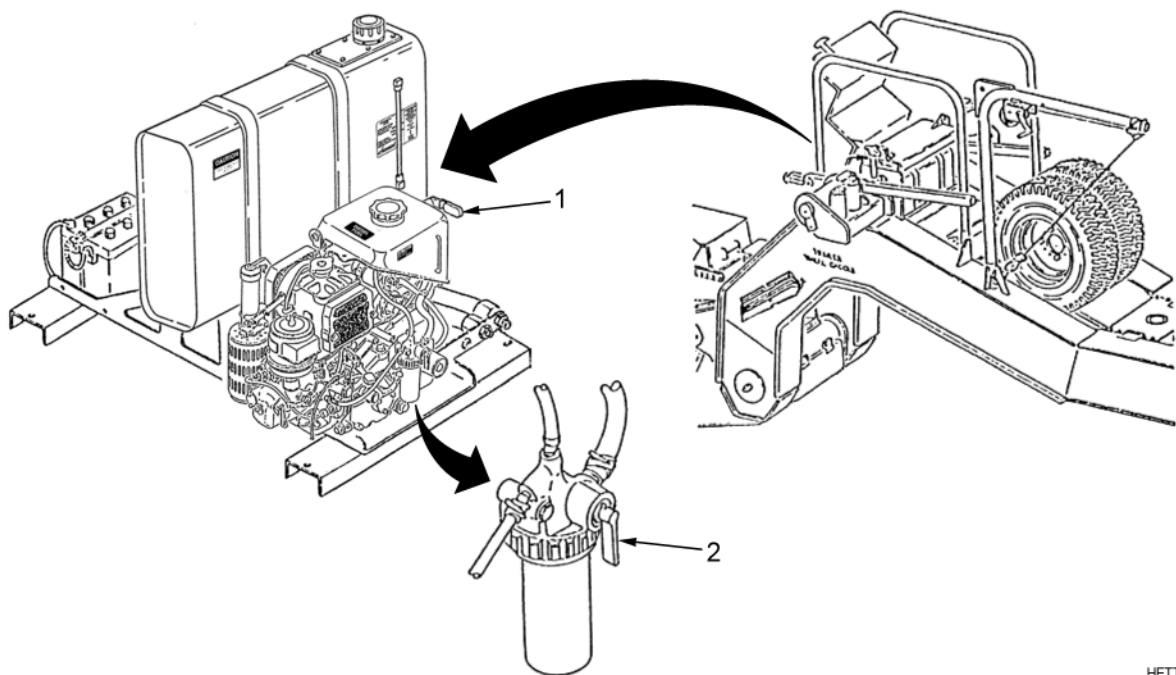
NOTE

- If it is determined that the swing-fire heater is going to be used, the gooseneck step section should be lowered to help contain heat applied by the swing-fire heater. If the swing-fire heater is not going to be used, skip steps 4, 5, and 6 and proceed to step 14.
- The step section is shown in the raised position.

4. If swing-fire heater is going to be used, lower and secure gooseneck step section (WP 0035).

CAUTION

- The swing-fire heater must be moved (played) back and forth in a constant motion, and it must be kept within 7 to 10 in. (17 to 25 cm) from the bottom of the APU crankcase while using the swing-fire heater, or damage to equipment may result.
 - DO NOT allow the swing-fire heater to sit in one spot. Heat any hydraulic line or diesel fuel line, or heat electrical wiring that may be in the general area of the APU. Use caution when operating the swing-fire heater so that only the APU crankcase is directly heated or severe damage to equipment may result.
5. Preheat APU crankcase by keeping nozzle of swing-fire heater approximately 7 to 10 in. (17 to 25 cm) away from bottom of crankcase and continually moving nozzle back and forth for a minimum of 15 minutes. Proceed with step 6 below.
 6. If heating was performed using swing-fire heater, gain access to APU by raising step section (WP 0035).



HETT0733

Figure 1. Arctic Weather APU Starting.

NOTE

- If outside temperatures are above -25°F (-32°C), proceed to step 14 below.
 - If outside temperatures are between -25 to -50°F (-31 to -46°C), proceed as follows.
 - The decompression valve is shown in the OPEN position.
7. Open decompression valve (Figure 2, Item 7) by pulling up and holding decompression valve handle (Figure 2, Item 6).
 8. With aid of an assistant, open APU control box cover (Figure 2, Item 5), turn APU START switch (Figure 2, Item 2) to START position, and hold switch for approximately two minutes or until APU is cranking at normal cranking speed. Release APU START switch.
 9. With jet start petcock (Figure 2, Item 8) closed, prime jet start valve (Figure 2, Item 9) by pulling valve full out. Ensure that valve stays out.

NOTE

On the control box used with APU model number EB300-E, the glow plug indicator is changed from a glow-type indicator to a lamp driven by a timer.

10. With aid of an assistant, turn knob of APU throttle control (Figure 2, Item 4) counterclockwise until fully outward. With aid of an assistant, turn APU START switch (Figure 2, Item 2) to GLOW position and hold until glow plug indicator (glow type) (Figure 2, Item 3) illuminates brightly (15 to 20 sec) or until glow plug indicator (lamp) extinguishes (5 sec).
11. While holding decompression valve handle (Figure 2, Item 6), open (up), and with aid of an assistant, turn APU START switch (Figure 2, Item 2) to START position and hold. As APU cranks over, slowly lower decompression valve handle.
12. Once APU is at normal cranking speed, release decompression valve handle (Figure 2, Item 6). Turn jet start petcock (Figure 2, Item 8) counterclockwise to open. Pump jet start valve (Figure 2, Item 9) three times to prime APU. A few additional pumps may be necessary for the APU to run smoothly. With aid of an assistant, hold APU start switch (Figure 2, Item 2) to START position until engine is running smoothly, and then return APU start switch to OFF.

13. If APU starts, proceed to step 25 below. If APU does not start, repeat steps 1 through 11 above. If APU fails to start after three attempts, notify field maintenance.
14. With jet start petcock (Figure 2, Item 8) closed, prime jet start valve (Figure 2, Item 9) by pulling valve full out. Ensure that valve stays out.
15. With aid of an assistant, on curbside of gooseneck, open cover (Figure 2, Item 5) on APU control box (Figure 2, Item 1).
16. With aid of an assistant, pull knob of APU throttle control (Figure 2, Item 4) fully outward.

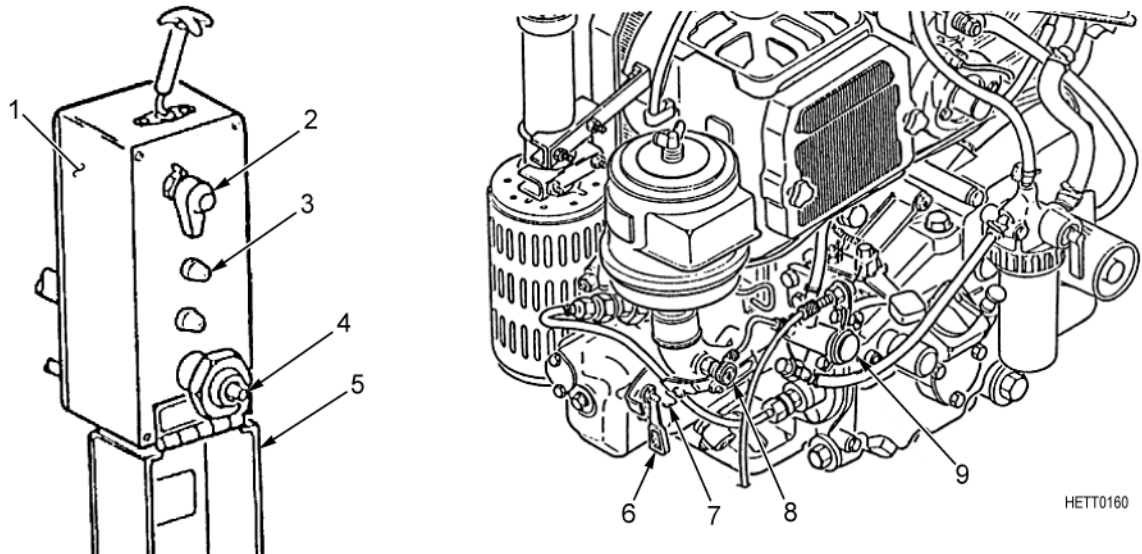


Figure 2. Arctic Weather APU Starting.

NOTE

On the control box with APU model number EB300-E, the glow plug indicator is changed from a glow-type indicator to a lamp driven by a timer.

17. With aid of an assistant, turn APU START switch (Figure 3, Item 1) to GLOW position and hold until glow plug indicator (glow-type) (Figure 3, Item 2) illuminates brightly (15 to 20 sec) or until glow plug indicator (lamp) extinguishes (5 sec).

CAUTION

DO NOT exceed 30 seconds of continuous cranking with decompression valve closed or damage to the starter may result. Allow the starter to cool down for at least 2 minutes between each 30-second cranking or damage to the starter may result.

18. With aid of an assistant, turn start switch (Figure 3, Item 1) to START position and hold for approximately 30 seconds.
19. Once APU engine starts to turn over, pump jet start valve (Figure 3, Item 7) three times to prime APU.
20. When APU engine is running smoothly, turn jet start petcock (Figure 3, Item 6) clockwise to close. Lower and secure step section (WP 0035).

NOTE

If the APU starts and/or fails to start, proceed as follows.

21. If APU starts, proceed to step 25 of this procedure.
22. If APU does not start, repeat steps 14 and 20 two more times (maximum).
23. If APU still does not start, lower and secure step section (WP 0035) and repeat steps 5 through 20 above as required for proper temperature range to which tractor/semitrailer is exposed.
24. If APU fails to start after three attempts, notify field maintenance.

NOTE

Once the APU starts, perform steps 25 and 26 to check the oil pressure indicator light.

25. If oil pressure indicator light (Figure 3, Item 3) does not come on, proceed to step 27 below.
26. If oil pressure indicator light (Figure 3, Item 3) does not go out when APU starts and runs for approximately 30 to 45 seconds, shut down APU by pushing throttle control (Figure 3, Item 4) all the way in. Close APU control box cover (Figure 3, Item 5) and notify field maintenance.

CAUTION

- Cold weather, especially arctic conditions, adversely affects the semitrailer's hydraulics in the areas of the gauge readings and the hydraulic filter indicator. During initial startup, the gauges will maintain higher than normal pressure readings and the filter indicator will read in the red. Ample time must be given for the APU and hydraulic fluid to warm up before operating the hydraulic system, or damage to equipment may result.
- During initial starting, the hydraulic filter indicator will read in the red zone. The red zone means the filter is clogged and filter bypass is occurring. Filter clogging at this point is because the hydraulic fluid viscosity is extremely high due to the cold temperatures and will decrease as the APU warms and the hydraulics begin to operate. **DO NOT** operate any of the hydraulic controls until the APU has had time to warm up, or damage to equipment may result.
- During initial starting, the hydraulic system pressure gauge can read as high as 2,200 psi (15,169 kPa). As the APU runs/warms up, the pressure ranges will start and continue to decrease. **DO NOT** operate the hydraulic controls until the APU has had time to warm up, or damage to equipment may result.

NOTE

Allow the APU to run for 20 minutes. If outside temperatures range from -25 to -50°F (-31 to -46°C), the filter indicator and hydraulic pressure gauges will not approach normal operating parameters until the semitrailer has been pulled/towed for a couple of hours. Periodically check that the pressure gauge and filter indicators are approaching normal conditions. If the indicators gradually decrease/return to normal operating ranges, the APU is ready for normal operation.

27. Perform steps 18 through 21 of APU Jump Start (WP 0020) to disconnect and stow APU jump start cables.

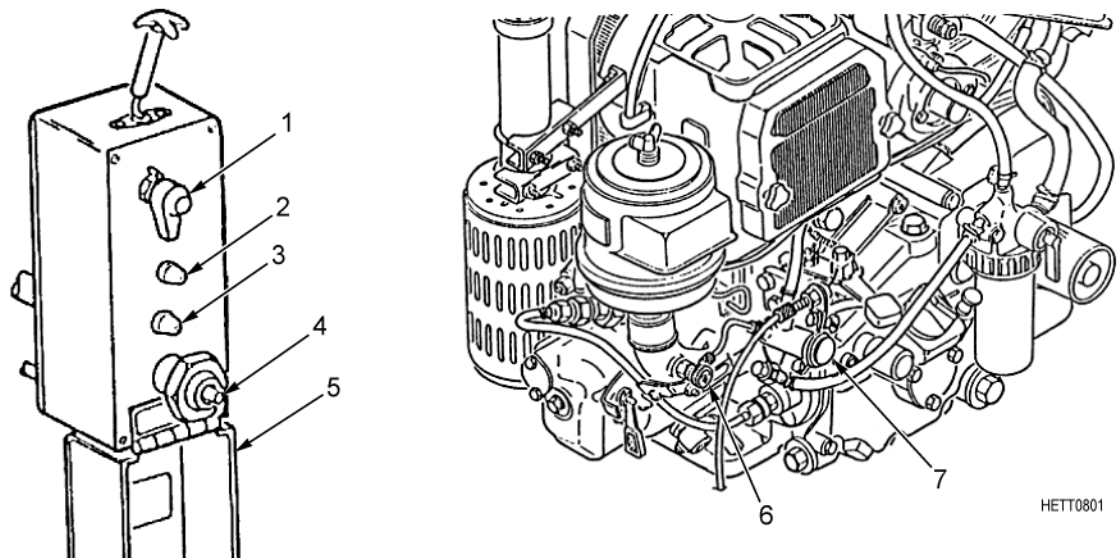


Figure 3. Arctic Weather APU Starting.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

OPERATION UNDER UNUSUAL CONDITIONS - OPERATION ON GRADES

INITIAL SETUP:

References
WP 0008

Personnel Required
1

GENERAL INFORMATION

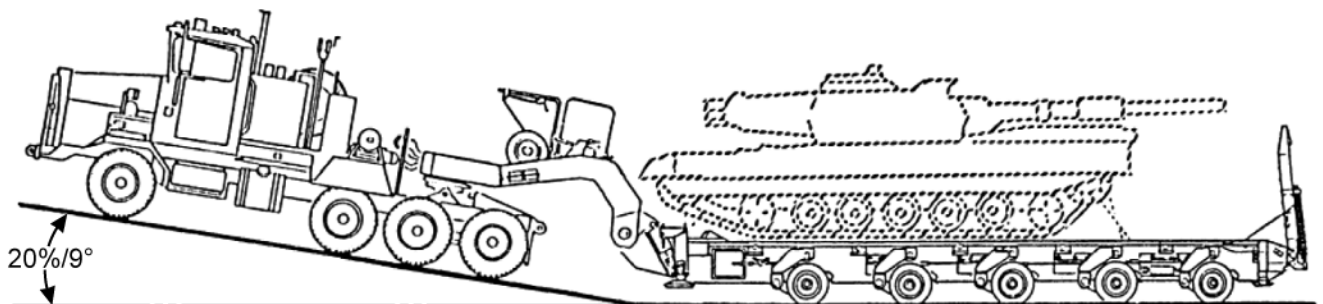
This work package contains instructions for operating the Heavy Equipment Transporter (HET) semitrailer on grades.

OPERATION ON GRADES

Approaching an Uphill Grade

CAUTION

- Because of the length of the tractor/semitrailer combination, one or more of the bogies will be lifted off of the ground when approaching or cresting a grade that is more than 15 percent. The semitrailer's suspension must be adjusted during these operations to ensure that all of the bogies maintain contact with the ground. This provides better stability when the semitrailer is loaded and reduces strain on the platform and suspension.
 - The maximum grade for a fully loaded semitrailer is 20 percent. Grades up to 30 percent may be negotiated, provided the payload does not exceed 50,000 lb (22,700 kg). **DO NOT** exceed a 30 percent grade. Exceeding these limitations may cause serious damage to the semitrailer.
1. Stop tractor/semitrailer combination before reaching grade.
 2. Lower platform (WP 0008) to minimum suggested height (1 in. of suspension cylinder plunger/piston exposed).
 3. Pull onto grade (Figure 1).
 4. If grade crest will be reached, proceed to the Cresting an Uphill Grade procedure below.
 5. If grade crest will not be reached, stop and raise platform (WP 0008) to normal height of 43 in. (109 cm).



HETT0161

Figure 1. Approaching an Uphill Grade.

END OF TASK

Cresting an Uphill Grade

1. Stop tractor/semitrailer combination before cresting grade.
2. Raise platform (WP 0008) to maximum suggested height of 50 in. (127 cm).
3. Proceed over crest of grade (Figure 2).
4. When semitrailer has crested grade, stop and lower platform (WP 0008) to normal height of 43 in. (109 cm).

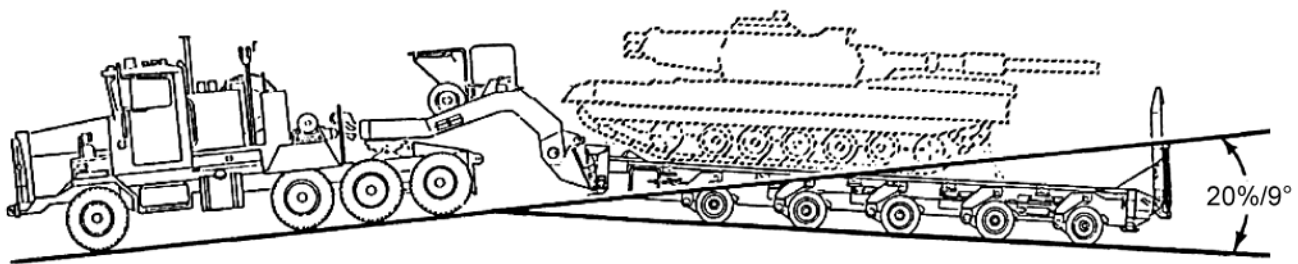


Figure 2. Cresting an Uphill Grade.

END OF TASK

Approaching a Downhill Grade

1. Stop tractor/semitrailer combination before reaching grade.
2. Raise platform (WP 0008) to maximum suggested height of 50 in. (127 cm).
3. Proceed down grade (Figure 3).
4. If tractor/semitrailer combination will approach level ground, proceed to Approaching Level Ground from Downhill Grade procedure below.
5. If tractor/semitrailer will not approach level ground, stop and lower platform (WP 0008) to normal height of 43 in. (109 cm).

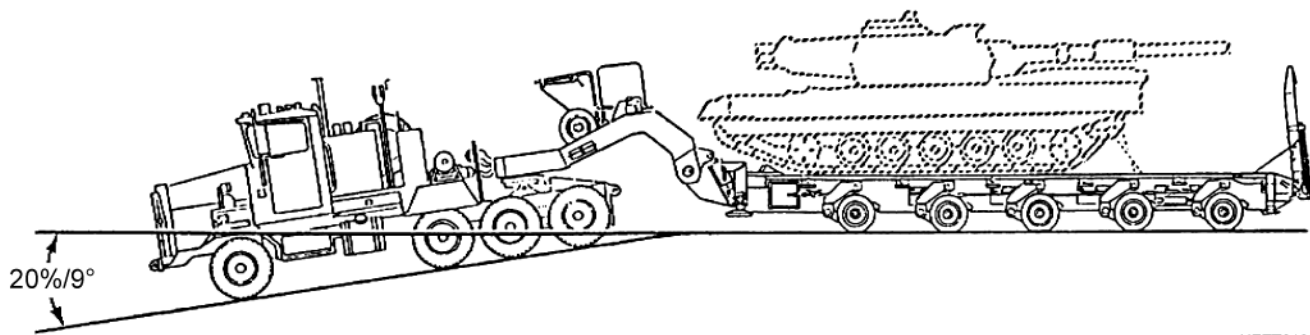


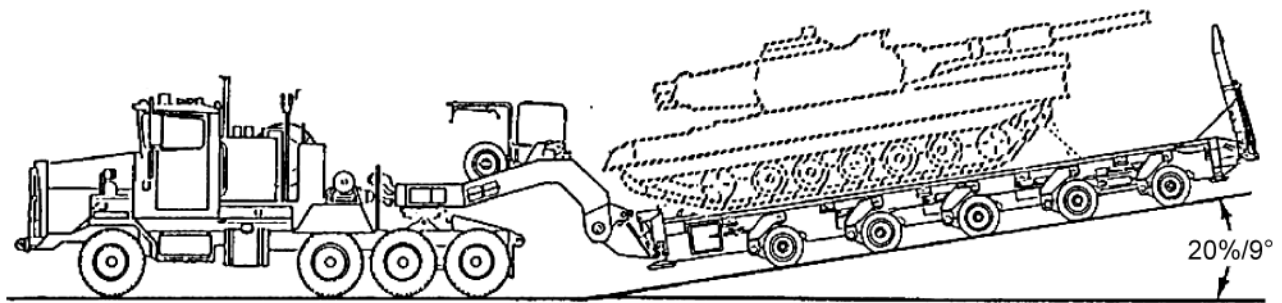
Figure 3. Approaching a Downhill Grade.

END OF TASK

Approaching Level Ground from Downhill Grade

1. Stop tractor/semitrailer combination before reaching level ground.
2. Lower platform (WP 0008) to minimum suggested height, 1 in. (2.54 cm) of suspension cylinder plunger/piston exposed.
3. Pull onto level ground (Figure 4).

4. When semitrailer is fully on level ground, stop and raise platform (WP 0008) to normal height of 43 in. (109 cm).



HETT0164

Figure 4. Approaching Level Ground from Downhill Grade.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**OPERATION UNDER UNUSUAL CONDITIONS - BRAKE CAGING/UNCAGING**

INITIAL SETUP:

Personnel Required

1

GENERAL INFORMATION

This work package contains instructions for caging and uncaging the brakes of the Heavy Equipment Transporter (HET) semitrailer.

BRAKE CAGING/UNCAGING**NOTE**

- This procedure releases the brakes in the event of a system failure, tire changing, or operation with a disabled bogie due to air brake problems.
- Ensure the semitrailer is parked on level ground and the front bogie wheels are chocked. If the semitrailer is coupled to a towing vehicle, apply the towing vehicle's parking brakes.

1. Remove nut (Figure 1, Item 3), washer (Figure 1, Item 2), and caging bolt (Figure 1, Item 4) from brake chamber (Figure 1, Item 5).
2. Lift dust plug (Figure 1, Item 1) from brake chamber (Figure 1, Item 5) and move dust plug aside. Check for caked mud and clean brake chamber if necessary.

NOTE

If air pressure is available, release the semitrailer's brakes to compress the spring brake. This will reduce the effort required to cage the brakes.

3. Insert key end of caging bolt (Figure 1, Item 4) as far as possible in brake chamber (Figure 1, Item 5). Once bottomed out, rotate caging bolt clockwise until it stops and locks in place.
4. While pulling slightly on caging bolt (Figure 1, Item 4), install washer (Figure 1, Item 2) and nut (Figure 1, Item 3). Hand-tighten nut until it makes contact with brake chamber (Figure 1, Item 5).
5. Use 10 in. (25.4 cm) adjustable wrench (WP 0169) to tighten nut (Figure 1, Item 3). As nut is tightened, caging bolt (Figure 1, Item 4) will draw on parking brake spring assembly and cage (release) the brakes.

NOTE

Visually check the brake shoes for contact with the brake drum (WP 0068). If there is no apparent contact, the brakes are caged. If there is still contact, continue turning nut clockwise until the brake shoe's contact with the brake drum is broken.

6. While trying to remove nut (Figure 1, Item 3) from caging bolt (Figure 1, Item 4), caging bolt may become unseated from brake chamber (Figure 1, Item 5) and pull out. If caging bolt comes out, remove nut and washer (Figure 1, Item 2) from caging bolt by hand.

NOTE

If air pressure is available, release the semitrailer's brakes to compress the spring brake. This will reduce the effort required to uncage the brakes.

7. To uncage brakes, turn nut (Figure 1, Item 3) counterclockwise, and remove nut and washer (Figure 1, Item 2) from caging bolt (Figure 1, Item 4). This will release brakes from caged position to full operating position/condition. Rotate caging bolt counterclockwise and remove from brake chamber (Figure 1, Item 5).
8. Reinstall dust plug (Figure 1, Item 1) in opening in top of brake chamber (Figure 1, Item 5). Ensure dust plug is properly seated in brake chamber.

NOTE

Ensure the caging bolt is returned to its stowed position on the brake chamber with the key end properly positioned.

9. Insert caging bolt (Figure 1, Item 4) back into stowed position on brake chamber (Figure 1, Item 5) and secure caging bolt in place by installing washer (Figure 1, Item 2) and nut (Figure 1, Item 3).

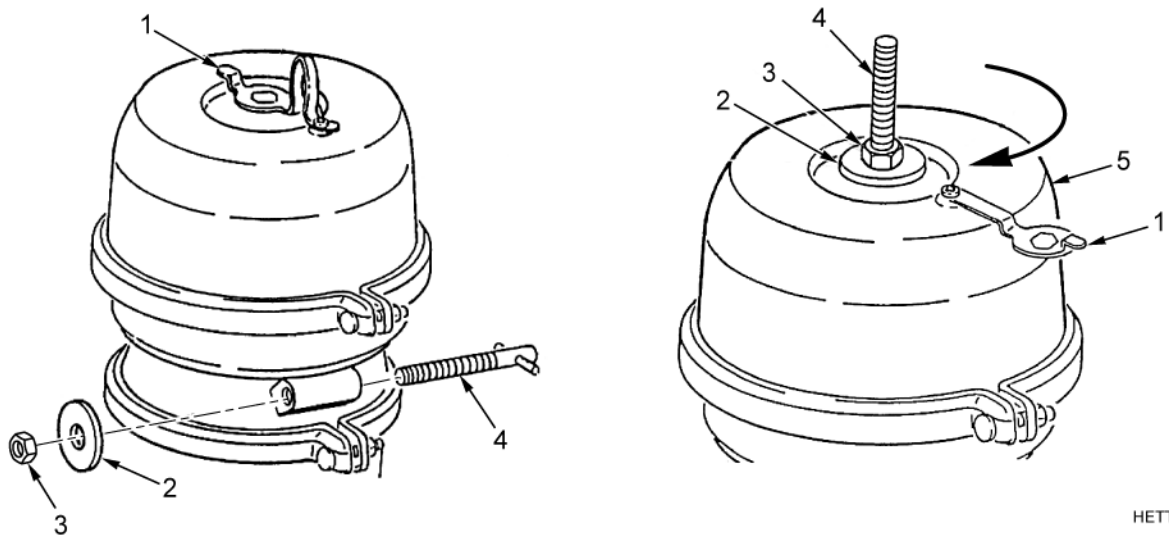


Figure 1. Brake Caging/Uncaging.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
OPERATION WITH DISABLED BOGIE

INITIAL SETUP:

References	Personnel Required
WP 0004	1
WP 0008	
WP 0011	
WP 0012	
WP 0013	
WP 0023	

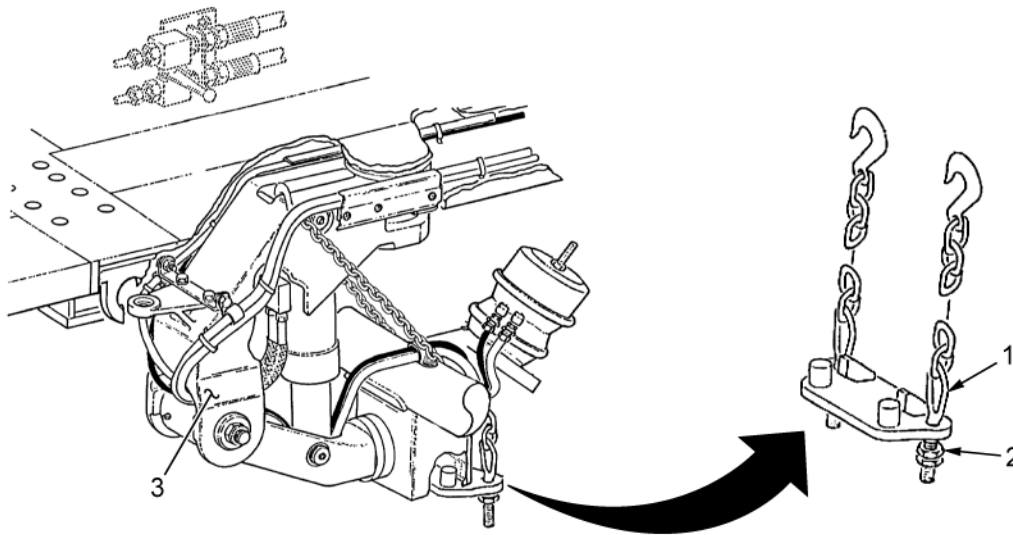
GENERAL INFORMATION

This work package contains instructions for operating the Heavy Equipment Transporter (HET) semitrailer with a disabled bogie.

OPERATION WITH DISABLED BOGIE**CAUTION**

The tractor/semitrailer combination, either loaded or unloaded, is limited to operating with only one disabled bogie. The following procedure specifically identifies how to prepare the semitrailer for transport. If this procedure is not strictly followed, severe damage to equipment may result.

1. Cage brakes at affected suspension (bogie) assembly (Figure 1, Item 3) (WP 0023).
2. Lower platform (WP 0008) until suspension (bogie) assembly (Figure 1, Item 3) is completely compressed.
3. Loosen and turn adjustment nuts (Figure 1, Item 2) on eyebolts (Figure 1, Item 1) until adjustment nuts are threaded completely down threaded portion of eyebolts.



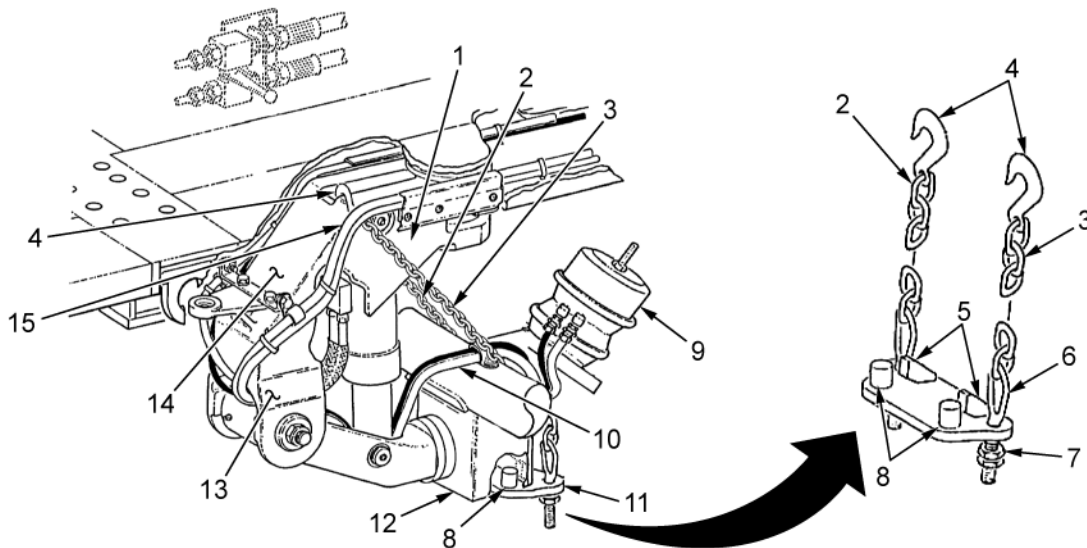
HETT0737

Figure 1. Operation With Disabled Bogie.

CAUTION

When installing the axle isolation chain assembly on the bogie, ensure that the chains DO NOT contact any hydraulic line or air brake hoses. Any contact of chains on the line and hoses may cause chafing or parting of lines/hoses, loss of air brake pressure, loss of hydraulic fluid, and damage to equipment.

4. Route hook (Figure 2, Item 4) of streetside chain (Figure 2, Item 3) along streetside of bogie assembly (Figure 2, Item 13) between both hydraulic (Figure 2, Item 15) and air brake line (Figure 2, Item 10) and upper suspension arm (Figure 2, Item 1) into opening in upper suspension arm casting (Figure 2, Item 14).
5. Position chain assembly bracket (Figure 2, Item 11) underneath square opening of axle casting (Figure 2, Item 12). Ensure that streetside chain (Figure 2, Item 3) is on streetside of parking brake chamber (Figure 2, Item 9).
6. Route hook (Figure 2, Item 4) of curbside chain (Figure 2, Item 2) along curbside of bogie assembly (Figure 2, Item 13) between both hydraulic (Figure 2, Item 15) and air brake line (Figure 2, Item 10) and upper suspension arm (Figure 2, Item 1) into opening in upper suspension arm casting (Figure 2, Item 14).
7. Position chain assembly bracket (Figure 2, Item 11) so that bottom rear edge of square axle casting (Figure 2, Item 12) sits between blocks (Figure 2, Item 5) and pins (Figure 2, Item 8) of chain assembly bracket.
8. Remove slack in chains (Figure 2, Item 2 and Item 3) by tightening adjustment nuts (Figure 2, Item 7) on eyebolts (Figure 2, Item 6).



HETT0736

Figure 2. Operation With Disabled Bogie.

WARNING

Ensure the suspension isolation valve at the affected bogie is closed (handle facing outward) prior to adjusting the platform height or the suspension chains may break. Failure to follow this warning may cause serious injury or death to personnel and damage to equipment.

NOTE

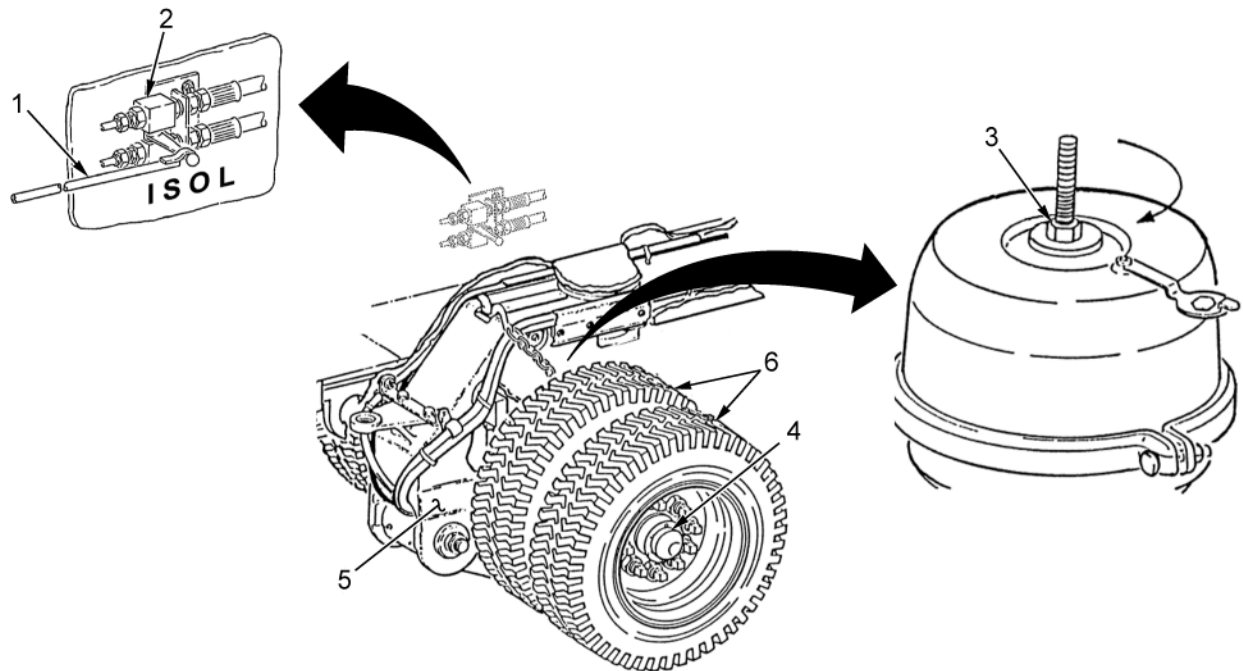
The suspension isolation valve handle is shown in the CLOSED position.

9. Pull suspension isolation valve handle (Figure 3, Item 1) outboard to CLOSED position to isolate affected bogie (Figure 3, Item 5).
10. Except at affected bogie (Figure 3, Item 5), ensure that all remaining suspension isolation valves (Figure 3, Item 2) (WP 0004) are in OPEN position (handles inward).
11. Raise platform (WP 0008) to normal running height of 43 in. (109 cm).

CAUTION

The brakes on the disabled bogie must be released without contacting the brake drum or damage to equipment may result.

12. Rotate dual tire assembly (Figure 3, Item 6) in both directions and check for brake drag or contact with brake drum (Figure 3, Item 4). If necessary, turn nut (Figure 3, Item 3) clockwise until dual tire assembly spins freely without brake drag or contact with brake drum.



HETT0735

Figure 3. Operation With Disabled Bogie.

WARNING

Because of minor load instability while driving with a disabled bogie, especially when carrying a payload, turning speeds must be reduced to 85 percent of the maximum safe turning speeds. Example: At 15 mph (24 kph), maximum turn speed should be reduced to 13 mph (21 kph) maximum turn speed. Failure to follow this warning may result in injury to personnel.

NOTE

The tractor/semitrailer combination with a disabled bogie, while loaded or unloaded, must be driven at reduced speeds.

13. DO NOT exceed maximum speed of 30 mph (48 kph) with semitrailer tire pressure at 95 psi (655 kPa) for all tires (Figure 4, Item 3), excluding tires on affected bogie (Figure 4, Item 2).

NOTE

- Semitrailer tires within the same suspension group as the affected bogie may be inflated to 100 psi (689 kPa) to allow for a slight increase in driving ability.
 - Suspension groups are determined using the suspension controls on the hydraulic control panel (WP 0004) consisting of curbside front, streetside front, and rear.
 - If the tractor is outfitted with an external air connector to run the pneumatic tools/components, follow steps 14 and 15.
14. Inflate remaining tires (Figure 4, Item 3) in affected suspension group, excluding tires on affected bogie (Figure 4, Item 2), to 100 psi (689 kPa).
15. DO NOT exceed maximum speed of 40 mph (64 kph) with tire pressure at 100 psi (689 kPa) for tires (Figure 4, Item 3) within a suspension group, excluding tires on affected bogie (Figure 4, Item 2).

NOTE

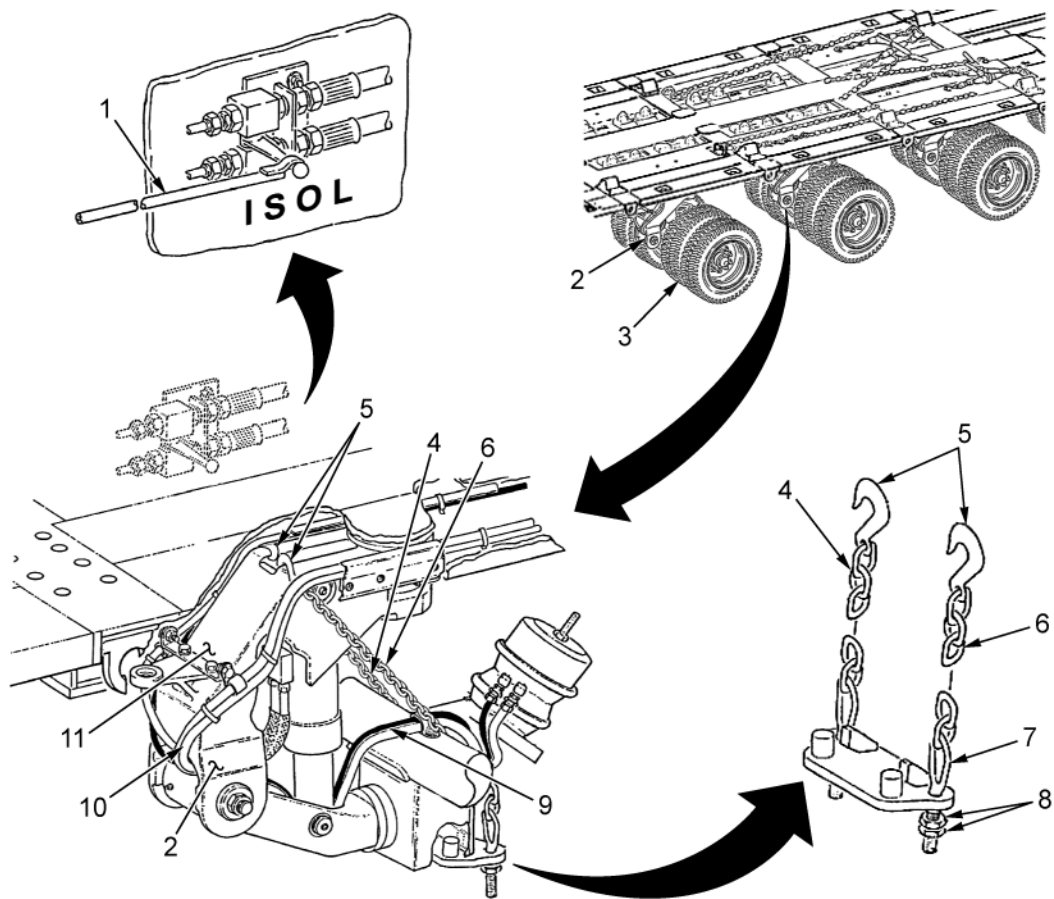
Once the semitrailer has reached a maintenance facility, perform steps 16 through 24 to remove the isolation chains.

16. Park semitrailer, apply parking brakes, and chock wheels (WP 0013).
17. Lower platform (WP 0008) until suspension (bogie) (Figure 4, Item 2) is completely compressed.
18. Loosen and turn four adjustment nuts (Figure 4, Item 8) on eyebolts (Figure 4, Item 7) until nuts are threaded completely down threaded portion of eyebolts.
19. Unhook two hooks (Figure 4, Item 5) from opening in upper suspension arm (Figure 4, Item 11). Move hooks out from under hydraulic hose (Figure 4, Item 10) and pneumatic hose (Figure 4, Item 9) on upper suspension arm.

NOTE

The suspension isolation valve handle is shown in the CLOSED position.

20. Open suspension isolation valve handle (Figure 4, Item 1) (WP 0004).
21. Raise platform (WP 0008) to normal running height of 43 in. (109 cm).
22. Lower both front and rear support legs (WP 0011 and WP 0012).
23. Uncage brakes at affected bogie (Figure 4, Item 2) (WP 0023).
24. Remove axle isolation chains (Figure 4, Item 4 and Item 6) from bogie (Figure 4, Item 2). Restow axle isolation chains.



HETT0734

Figure 4. Operation With Disabled Bogie.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**OPERATION UNDER UNUSUAL CONDITIONS - PARKING LOADED SEMITRAILER**

INITIAL SETUP:**References**

WP 0007
WP 0011

WP 0012
WP 0013
TM 9-2320-360-10

GENERAL INFORMATION

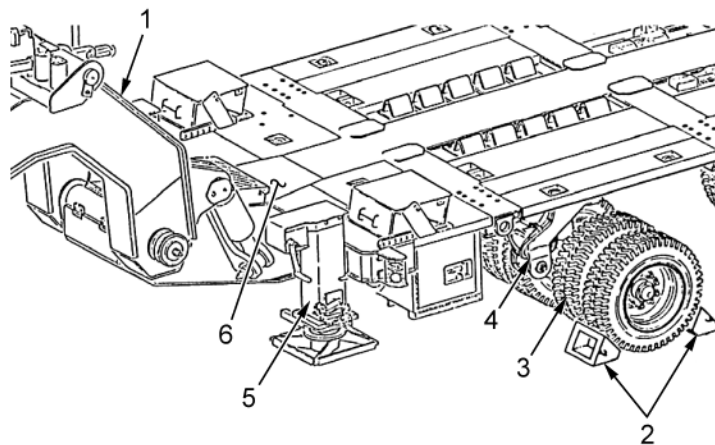
This work package contains instructions for parking a loaded Heavy Equipment Transporter (HET) semitrailer.

PARKING LOADED SEMITRAILER**WARNING**

- For parking a loaded semitrailer while **COUPLED** to a tractor, perform steps 1 through 3.
- For parking a loaded semitrailer and **UNCOUPLING** from a tractor, perform steps 1 through 4.

Failure to follow this warning may result in injury to personnel and damage to equipment.

1. Apply tractor and semitrailer parking brakes (TM 9-2320-360-10).
2. Place chocks (Figure 1, Item 2) in front of semitrailer front bogie (Figure 1, Item 4) and in front of and behind each outer set of dual tires (Figure 1, Item 3).
3. Lower both front and rear support legs (Figure 1, Item 5) (WP 0011 and WP 0012) to support platform (Figure 1, Item 6).
4. Uncouple tractor/semitrailer (WP 0013) and lower gooseneck (Figure 1, Item 1) (WP 0007) to lowest position.



HETT0738

Figure 1. Parking Loaded Semitrailer.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**OPERATION UNDER UNUSUAL CONDITIONS - ISO CONTAINER LOCK BRACKETS**

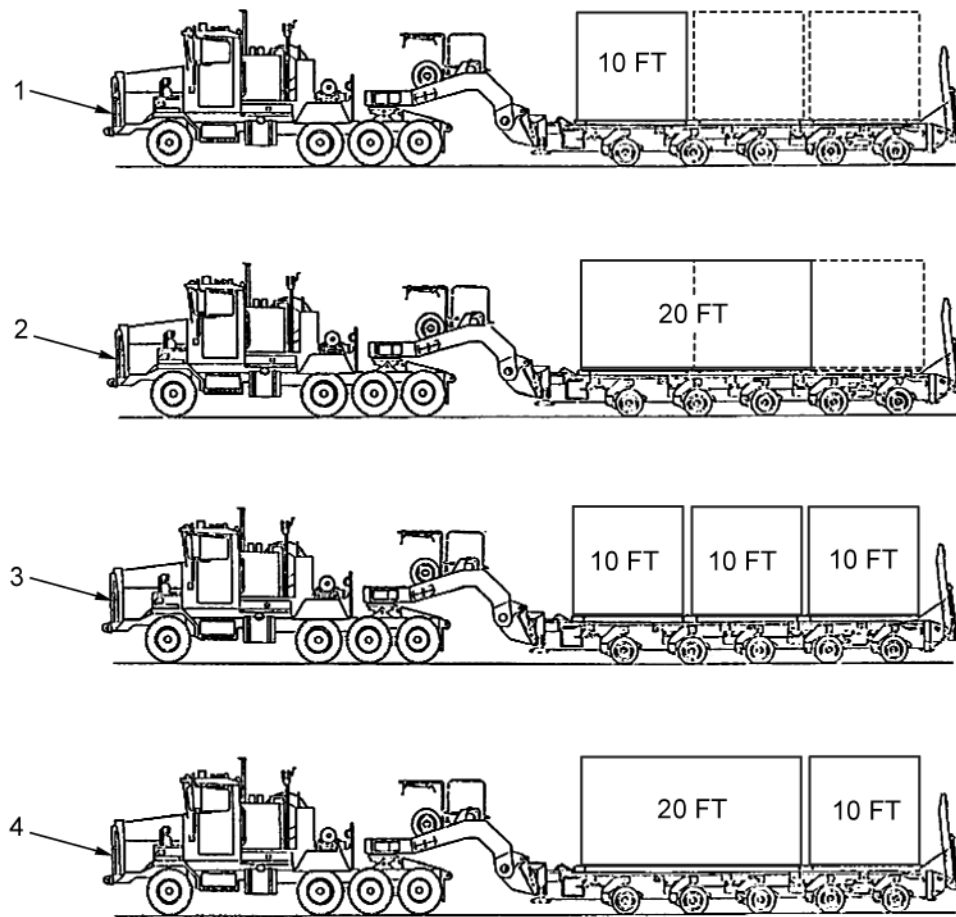
INITIAL SETUP:**Personnel Required**1

GENERAL INFORMATION

This work package contains instructions for the operation of the Heavy Equipment Transporter (HET) semitrailer's International Standards Organization (ISO) container lock brackets.

ISO CONTAINER LOCK BRACKETS**NOTE**

- Depending upon the type and quantity of containers being transported, not every ISO container lock bracket needs to be used. Study the illustration below to determine the positions and quantities of lock brackets needed to secure the type and quantity of ISO containers to be transported.
- The ISO lock brackets marked "curb" and "street" have only one lug and one F-pin attached. These should always be mounted in the most forward and rearward corner positions on the platform with the lugs toward the rear. The ISO container brackets with two F-pins attached should always be used in the four center platform positions.
- The semitrailer is capable of carrying the following types and quantities of ISO containers.
 1. For either a single 10 ft (3 m) (Figure 1, Item 1) or 20 ft (6 m) ISO container (Figure 1, Item 2), four ISO lock brackets are required.
 2. For up to three 10 ft (3 m) ISO containers (Figure 1, Item 3), eight ISO lock brackets are required.
 3. For a combination of one 20 ft (6 m) and one 10 ft (3 m) ISO container (Figure 1, Item 4), six ISO lock brackets are required.



HETT0171

Figure 1. ISO Container Lock Brackets.

NOTE

There is a total of eight ISO lock brackets stored on the platform. After the position of ISO containers has been determined for transport, locate the respective ISO lock brackets needed for proper mounting.

4. To remove an ISO lock bracket (Figure 2, Item 1) from platform (Figure 2, Item 6), remove bolt (Figure 2, Item 2) and lift ISO lock bracket from stowed position on platform. Remove as many ISO lock brackets as required.
5. Place ISO lock bracket (Figure 2, Item 1) at respective points on platform (Figure 2, Item 6) as required. Secure ISO lock bracket with bolt (Figure 2, Item 2).
6. Align and install ISO containers (Figure 2, Item 5) over ISO lock bracket lugs (Figure 2, Item 4).

NOTE

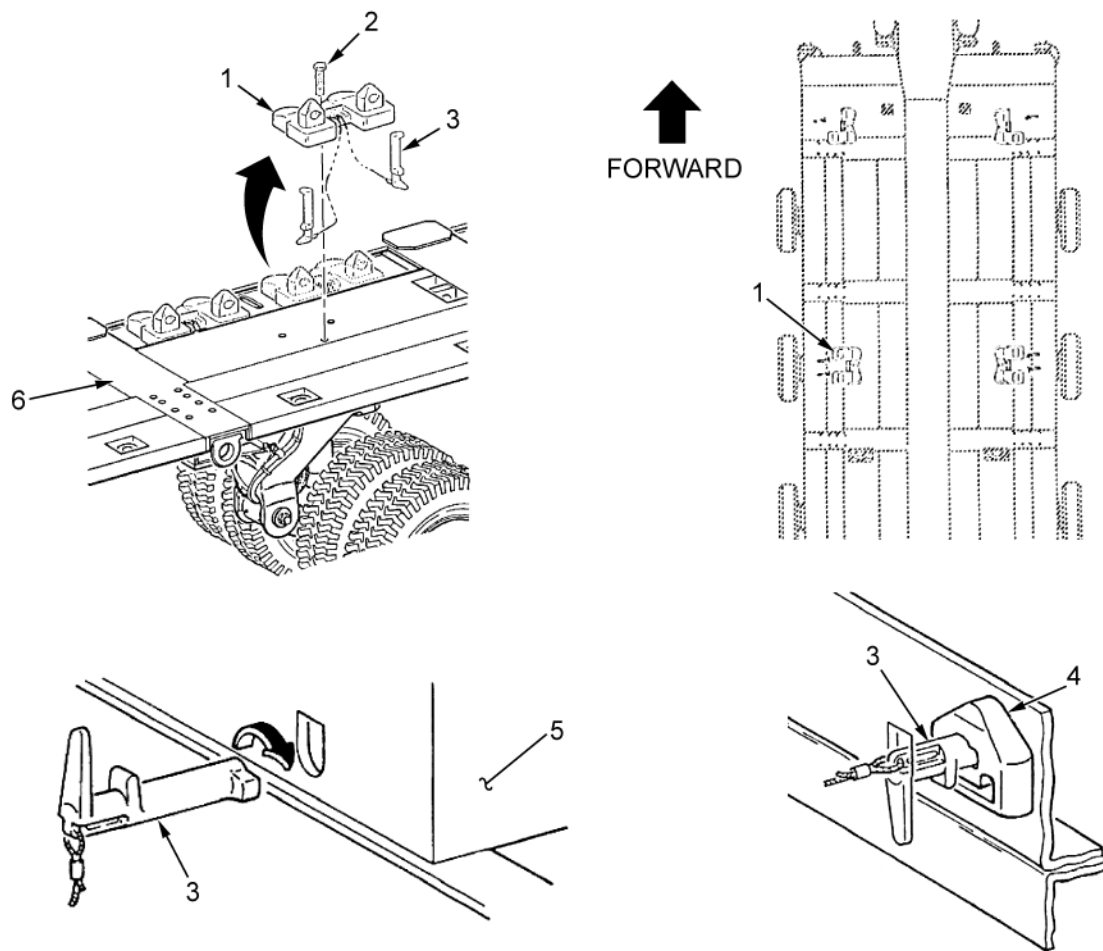
- Check that the holes in ISO lock bracket lugs are aligned with the holes in the ISO container.
- Perform steps 7 through 9 to secure the ISO container onto the platform.

7. Insert F-pin (Figure 2, Item 3), small end first, through hole in ISO container (Figure 2, Item 5) and ISO lock bracket lug (Figure 2, Item 4).
8. Rotate F-pin (Figure 2, Item 3) clockwise to secure ISO container (Figure 2, Item 5).
9. Repeat steps 1 and 2 for each ISO lock bracket lug (Figure 2, Item 4) installed until all ISO lock brackets (Figure 2, Item 1) are secured.

NOTE

After the ISO containers have been transported, perform steps 10 through 12 to unstow the ISO container.

10. Rotate F-pin (Figure 2, Item 3) counterclockwise. Pull F-pin out of ISO container (Figure 2, Item 5) and ISO lock bracket lug (Figure 2, Item 4). Repeat this step as required until all F-pins are removed.
11. Remove ISO containers (Figure 2, Item 5) from platform (Figure 2, Item 6).
12. Remove bolt (Figure 2, Item 2) and ISO lock bracket (Figure 2, Item 1) from platform (Figure 2, Item 6). Restow ISO lock bracket in center of platform and secure ISO lock bracket with bolt. Repeat this step as required until all ISO lock brackets are restowed.



HETT0172

Figure 2. ISO Container Lock Brackets.

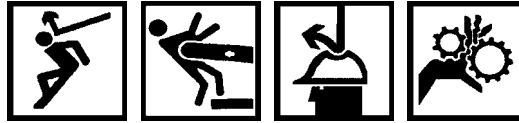
END OF TASK**END OF WORK PACKAGE**

OPERATION UNDER UNUSUAL CONDITIONS - DISABLED LOADING RAMP RECOVERY

References

WP 0009
WP 0013
TM 9-2320-360-10

This work package contains instructions for the recovery of a disabled loading ramp on the Heavy Equipment Transporter (HET) semitrailer.

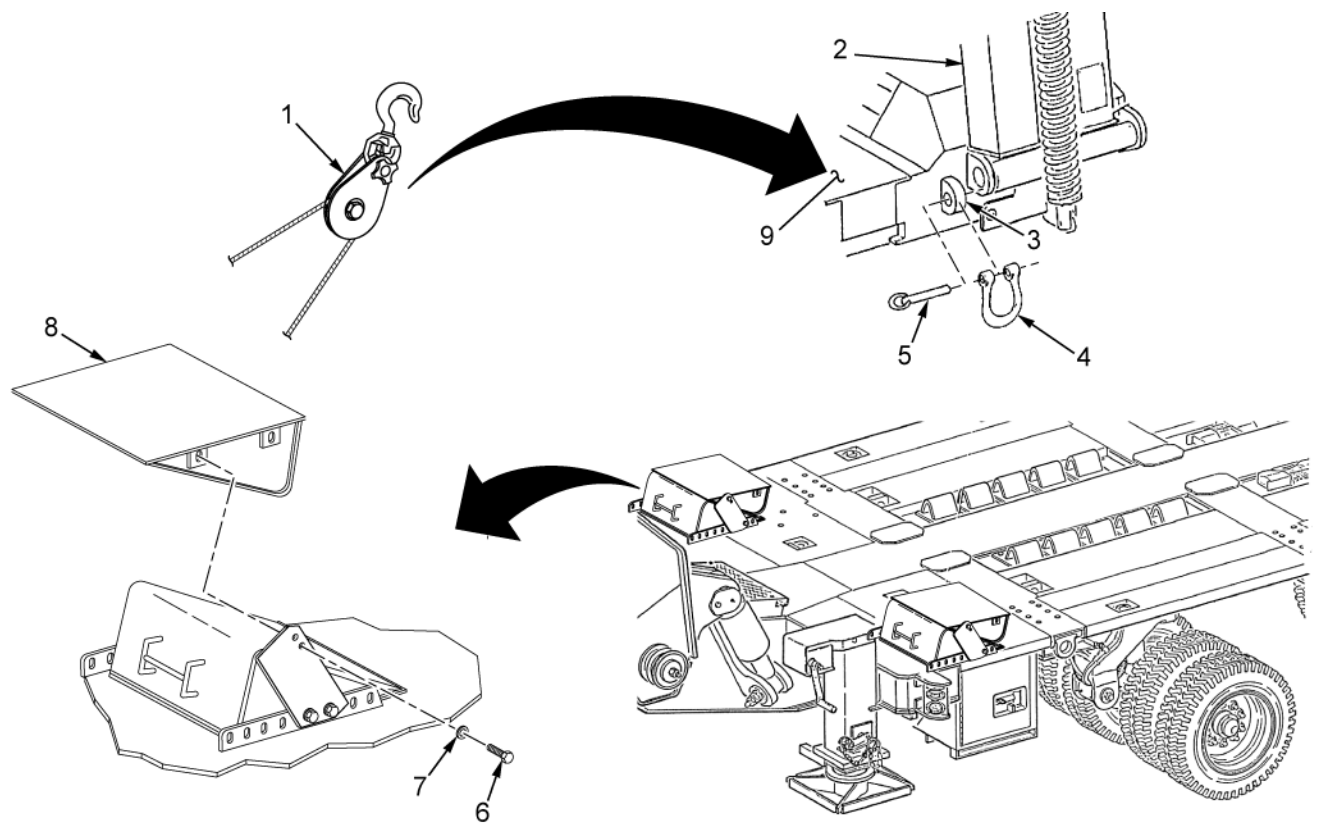
DISABLED LOADING RAMP RECOVERY**WARNING**

DO NOT attempt to perform this procedure if the semitrailer is loaded or going to be loaded. Failure to follow this warning may result in injury to personnel.

NOTE

This procedure can be accomplished using the M1070 tractor.

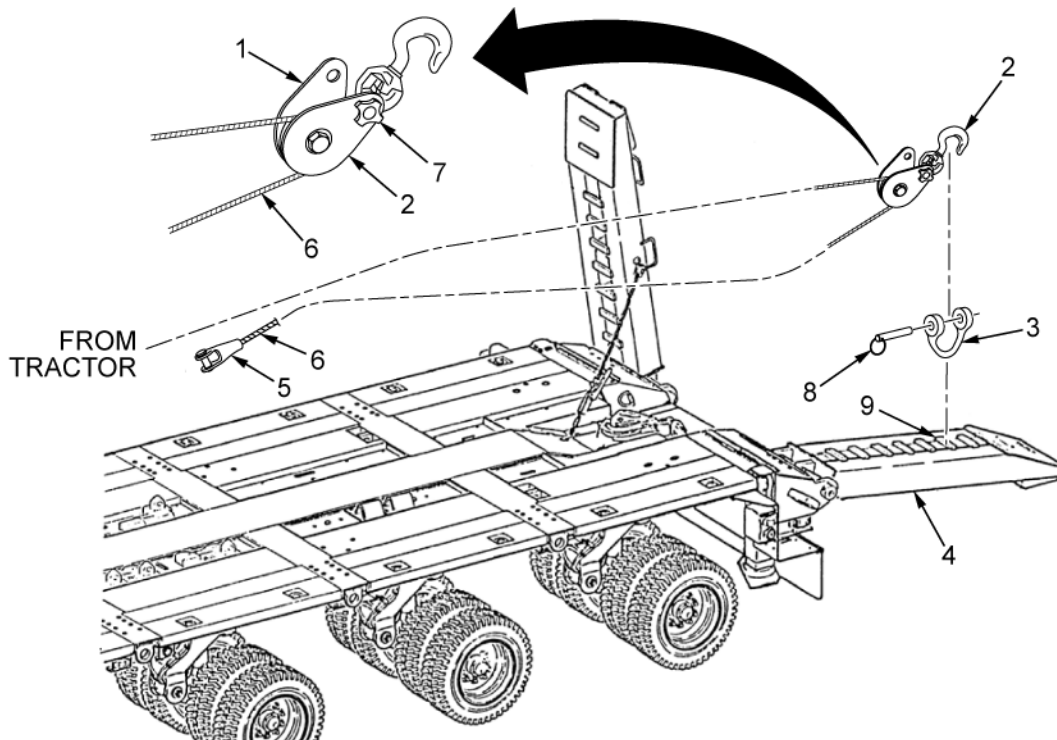
1. Start and warm M1070 tractor (TM 9-2320-360-10).
2. Couple M1070 tractor and semitrailer (WP 0013).
3. Apply parking brakes on both tractor and semitrailer by operating brake controls inside M1070 tractor (TM 9-2320-360-10).
4. Remove auxiliary snatch block (Figure 1, Item 1) from storage on M1070 tractor and place auxiliary snatch block on platform (Figure 1, Item 9) near disabled ramp (Figure 1, Item 2).
5. Remove pin (Figure 1, Item 5) and shackle (Figure 1, Item 4) from rear recovery eye (Figure 1, Item 3) at back of platform (Figure 1, Item 9). Place shackle with pin on platform near disabled ramp (Figure 1, Item 2).
6. Remove two capscrews (Figure 1, Item 6) and lockwashers (Figure 1, Item 7) from payload chock (Figure 1, Item 8). Remove payload chock and place payload chock on platform (Figure 1, Item 9) near disabled ramp (Figure 1, Item 2).



HETT0740

Figure 1. Disabled Loading Ramp.

7. Attach auxiliary snatch block (Figure 2, Item 2) to second from top rung (Figure 2, Item 9) on loading ramp (Figure 2, Item 4) with pin (Figure 2, Item 8) and shackle (Figure 2, Item 3).
8. Unscrew retainer bolt (Figure 2, Item 7) and rotate top side plate (Figure 2, Item 1) of auxiliary snatch block (Figure 2, Item 2).
9. Winch operator must pay out auxiliary winch cable (Figure 2, Item 6) so that clevis (Figure 2, Item 5) on winch cable is approximately 4 ft (1.2 m) past auxiliary snatch block (Figure 2, Item 2). Pass auxiliary winch cable through opened snatch block and pull cable back toward gooseneck.
10. Rotate top plate (Figure 2, Item 1) on auxiliary snatch block (Figure 2, Item 2) back to normal position and secure top plate by tightening retainer bolt (Figure 2, Item 7).



HETT0742

Figure 2. Disabled Loading Ramp.

NOTE

If the curbside loading ramp is disabled, attach the auxiliary winch cable clevis to the platform D-ring over the curbside No. 4 bogie. If the streetside loading ramp is disabled, attach the auxiliary winch cable clevis to the platform D-ring over the streetside No. 4 bogie.

11. Winch operator must pay out auxiliary winch cable (Figure 3, Item 5) until winch cable reaches D-ring (Figure 3, Item 16) located over either curbside or streetside No. 4 bogie (Figure 3, Item 15).
12. Remove hitch pin (Figure 3, Item 14) and shouldered pin (Figure 3, Item 19) from clevis (Figure 3, Item 13) of auxiliary winch cable (Figure 3, Item 5).
13. Attach clevis (Figure 3, Item 13) to D-ring (Figure 3, Item 16) over No. 4 bogie (Figure 3, Item 15) on same side affected ramp (Figure 3, Item 4) is located.
14. Secure clevis (Figure 3, Item 13) of auxiliary winch cable (Figure 3, Item 5) to D-ring (Figure 3, Item 16) by installing shouldered pin (Figure 3, Item 19) and hitch pin (Figure 3, Item 14).

NOTE

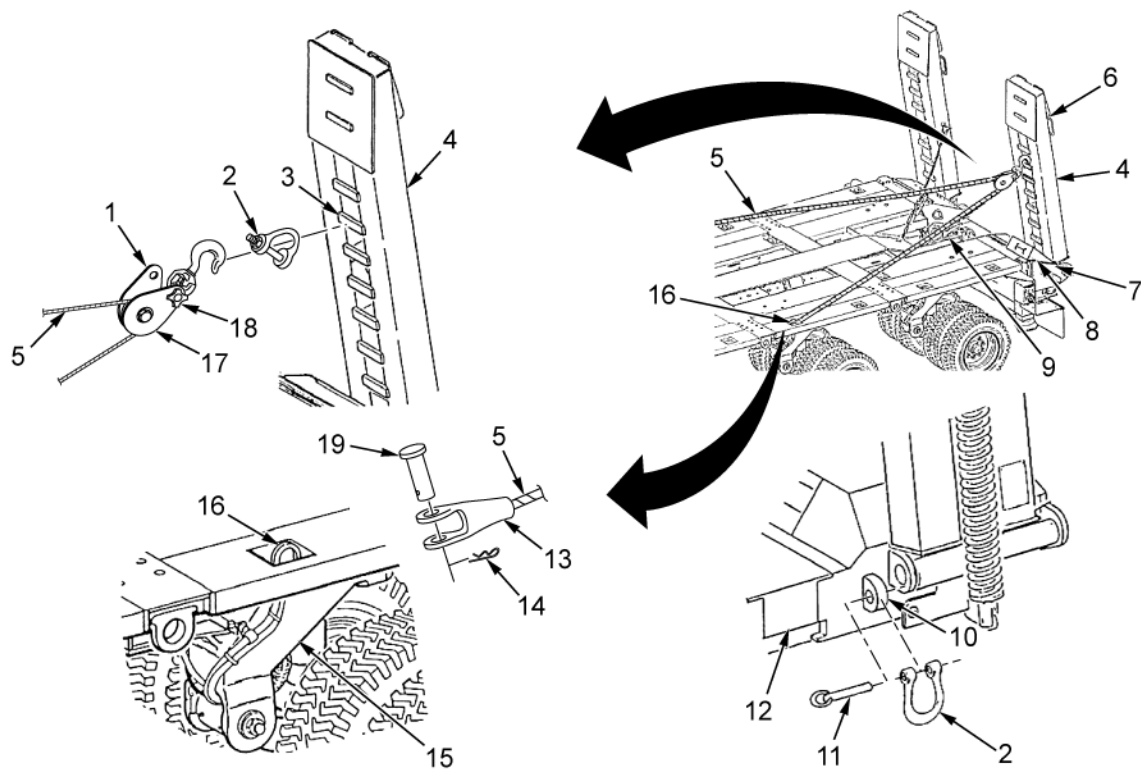
- The winch operator must continue to pay out the auxiliary winch cable so that there is enough slack in the cable to reach the streetside gooseneck cable guide. Pass the auxiliary winch cable through the streetside gooseneck cable guide.
 - When placing the payload chock in place, ensure to center the chock directly in front of the loading ramp so that both parts of the auxiliary winch cable run over the top of the chock.
15. Place payload chock (Figure 3, Item 8) on down-sloping portion of beavertail (Figure 3, Item 7), directly in front of disabled ramp (Figure 3, Item 4).
 16. Winch operator must remove slack in auxiliary winch cable (Figure 3, Item 5) and retract winch cable until disabled ramp (Figure 3, Item 4) starts to rise.

NOTE

As the ramp starts to rise, it may be necessary to have a person pull upward on the ramp handle to help the ramp break over the horizontal position.

17. Winch operator must continue to retract auxiliary winch cable (Figure 3, Item 5), and if necessary, a second person must pull up on handle (Figure 3, Item 6) on inward edge of ramp (Figure 3, Item 4) until ramp raises to stowed position.
18. Winch operator must keep tension on auxiliary winch cable (Figure 3, Item 5). Secure ramp (Figure 3, Item 4) in stowed position by attaching stow chain (Figure 3, Item 9) to stow point on platform (Figure 3, Item 12).
19. Once ramp (Figure 3, Item 4) is stowed and secured in place with stow chain (Figure 3, Item 9), winch operator must pay out slack in auxiliary winch cable (Figure 3, Item 5).

20. Unscrew retainer bolt (Figure 3, Item 18) and rotate top side plate (Figure 3, Item 1) of auxiliary snatch block (Figure 3, Item 17).
21. Remove auxiliary winch cable (Figure 3, Item 5) from opened snatch block (Figure 3, Item 17). Rotate top plate (Figure 3, Item 1) on auxiliary snatch block back to normal position and secure by tightening retaining bolt (Figure 3, Item 18).
22. Remove shackle (Figure 3, Item 2) and auxiliary snatch block (Figure 3, Item 17) from rung (Figure 3, Item 3) on ramp (Figure 3, Item 4). Stow shackle with pin (Figure 3, Item 11) on rear recovery eye (Figure 3, Item 10) at back of platform (Figure 3, Item 12).
23. Remove hitch pin (Figure 3, Item 14) and shouldered pin (Figure 3, Item 19) from clevis (Figure 3, Item 13) of winch cable (Figure 3, Item 5). Remove clevis of winch cable from D-ring (Figure 3, Item 16) over No. 4 bogie (Figure 3, Item 12).



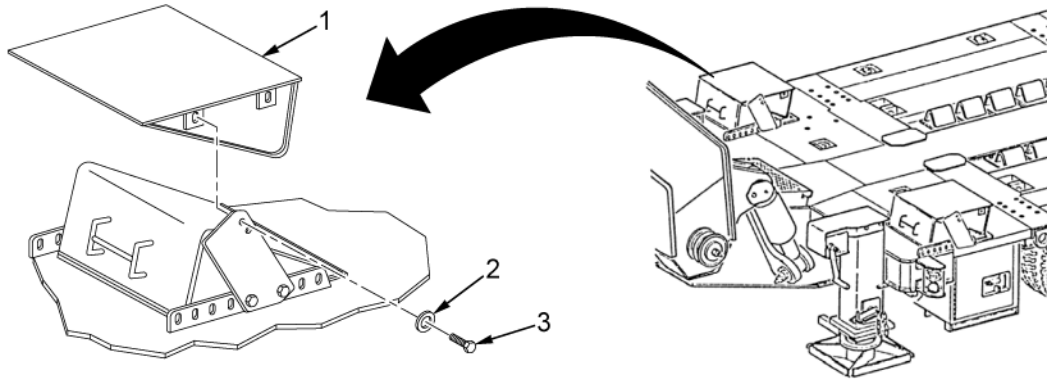
HETT0739

Figure 3. Disabled Loading Ramp.

NOTE

Remove the auxiliary winch cable from the streetside gooseneck cable guide and restow the auxiliary winch cable on the M1070 tractor.

24. Place payload chock (Figure 4, Item 1) back in stowed position and secure payload chock in place with two lockwashers (Figure 4, Item 2) and capscrew (Figure 4, Item 3).
25. If ramp span width adjustment must be made, adjust ramp span width to inward/stowed position (WP 0009).



HETT0741

Figure 4. Disabled Loading Ramp.

END OF TASK

END OF WORK PACKAGE

CHAPTER 3
TROUBLESHOOTING PROCEDURES
FOR
SEMITRAILER, TRANSPORTER, HEAVY EQUIPMENT 70 TON, M1000

FIELD MAINTENANCE

TROUBLESHOOTING INDEX

GENERAL INFORMATION

This work package lists the common malfunctions that may be found during the operation or maintenance of the Heavy Equipment Transporter (HET) semitrailer and its components. Perform the tests, inspections, and corrective actions in the order listed.

This manual cannot list all malfunctions that may occur, nor all tests, inspections, and corrective actions. If a malfunction is not listed or is not corrected by the listed corrective actions, notify your supervisor.

Before trying to troubleshoot the semitrailer, be sure you understand the basic operating instructions outlined in Chapter 2.

Before performing field level maintenance, verify that the operator/crew troubleshooting has been completed and a failed condition does exist. Further verify that all other indications are normal except for suspected fail condition. Once fault has been isolated, repair or replace failed component.

The troubleshooting procedures are grouped by major categories. Become familiar with these major equipment categories. Use the symptom index to easily locate the fault in question.

Malfunction/Symptom

Troubleshooting Procedure

AUXILIARY POWER UNIT (APU)

1. Engine does not crank over	WP 0029
2. Engine cranks but does not start	WP 0029
3. Engine runs rough	WP 0029
4. Insufficient engine output or "low power".	WP 0029
5. White or blue exhaust smoke is observed after warmup	WP 0029
6. Black or dark gray exhaust smoke is observed after warmup	WP 0029
7. Low oil pressure indicator light is lit.	WP 0029
8. Oil pressure is low	WP 0029
9. Oil consumption is excessive (over 1 pint (0.5 L) per 250 hours of operation).	WP 0029
10. Fuel is mixed into lubricant oil	WP 0029
11. Engine coolant is mixed in lubricant oil	WP 0029
12. Engine is overheating	WP 0029
13. Battery has low charge	WP 0029
14. Battery will not hold charge	WP 0029
15. Auxiliary Power Unit (APU) charging circuit fails to keep battery charged	WP 0029
16. Glow plug heats slowly or fails to heat	WP 0029
17. APU jump start system is inoperable	WP 0029

HYDRAULIC SYSTEM

18. General hydraulic failures	WP 0030
19. External leaks	WP 0030
20. System will not maintain normal or adequate operating pressure	WP 0030

- | | |
|--|---------|
| 21. Pump is making excessive noise or pump has failed | WP 0030 |
| 22. Platform suspension will not adjust or adjustments are sluggish | WP 0030 |
| 23. Platform suspension drifts down or drops | WP 0030 |
| 24. Suspension rides stiff and does not adjust for bumps/road hazards | WP 0030 |
| 25. Suspension tire change chain is over stressed and/or breaks. | WP 0030 |
| 26. Gooseneck will not adjust or adjustments are sluggish | WP 0030 |
| 27. Gooseneck drifts down, drops, or will not support itself | WP 0030 |
| 28. Oil or air is being relieved from gooseneck cylinder air reservoir | WP 0030 |
| 29. Steering will not adjust | WP 0030 |
| 30. Steering pressure indicator light comes on | WP 0030 |
| 31. Semitrailer steering does not track properly | WP 0030 |

ELECTRICAL SYSTEM

- | | |
|--|---------|
| 32. Steering pressure indicator does not light when pressure is low. | WP 0031 |
| 33. None of the lamps light | WP 0031 |
| 34. One or more (but not all) lights will not light | WP 0031 |
| 35. Lights are dim or flickering | WP 0031 |

WHEELS, TIRES, AND HUBS

- | | |
|--|---------|
| 36. Wheel wobbles | WP 0032 |
| 37. Tire wear is excessive or uneven. | WP 0032 |
| 38. In tow, semitrailer wanders or pulls to one side (on level ground) | WP 0032 |

BRAKES

- | | |
|---|---------|
| 39. Brakes are weak or no brakes. | WP 0033 |
| 40. Brake has slow application or slow release. | WP 0033 |
| 41. Brakes are grabbing. | WP 0033 |

END OF WORK PACKAGE

FIELD MAINTENANCE

AUXILIARY POWER UNIT (APU) TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required

2

References

WP 0020

WP 0168

Electrical Schematic FO-7

INTRODUCTION

This work package covers Auxiliary Power Unit (APU) Troubleshooting.

Table 1. Auxiliary Power Unit (APU).

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
Engine does not crank over.	Starter or battery connections are loose or corroded.	<ol style="list-style-type: none"> 1. Check battery for loose connections. Tighten as necessary. 2. Check battery for corroded connections. If connections are corroded, notify field maintenance. 3. Check battery fluid level. If fluid level is low, notify field maintenance. 4. Check battery cables for defects. 5. Check battery cables for corrosion. 6. Check electrolyte level and specific gravity. Refill and recharge battery as required. 7. If battery is defective, replace battery. 8. Check for loose starter connections. Tighten as necessary. 9. Check starter for corroded connections. If connections are corroded, notify field maintenance. 10. Turn starter switch to START and listen for starter to engage. 11. Check APU wiring harness at starter for loose wires. Tighten connections. 12. Check APU wiring harness at starter for corroded connections or broken wires. Replace harness. 13. If starter does not engage, refer to APU electrical schematic (Figure FO-7) and, using multimeter (WP 0169), check continuity of starter solenoid, starter switch, and starter switch wiring. 14. If starter engages but does not turn over, remove and replace starter. 15. If engine does not turn over, or if flywheel is suspected to be binding, or if above steps DO NOT correct malfunction, notify field maintenance.

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
Engine cranks but does not start.	Fuel level in fuel tank is low.	1. Add proper grade of fuel to fuel tank.
	Fuel is in fuel filter.	1. Turn fuel petcock to open position.
	Jet start cock on air intake manifold is loose.	1. Tighten thumbscrew on jet start cock.
	Fuel filter is contaminated or filter block is clogged.	1. Disassemble fuel filter and filter block and check for blockage. 2. Clear passages, replace fuel filter, and reinstall fuel filter and filter block.
	Air cleaner is clogged or dirty.	1. If air cleaner is clogged, clean air cleaner. 2. If air cleaner is dirty, replace air cleaner.
	Nozzle holder is loose or blocked.	1. If nozzle holder is loose, tighten nozzle holder. 2. If nozzle holder is blocked, clear any blocked passages and reinstall or replace nozzle holder.
	Fuel line has a blockage.	1. Remove fuel line and check for blockage. 2. Clear blockage or replace fuel line.
	Injection pump is loose or leaking.	1. If injection pump is leaking or loose, notify field maintenance.
	Air intake manifold has blockage or holes.	1. Disassemble air intake manifold. 2. Inspect and clear blocked passages. 3. Replace intake manifold as required.
	Fuel in fuel system is contaminated.	1. Drain and flush tank. 2. Change fuel filter. 3. Refill tank with proper grade of fuel.
	Compression is low.	1. Listen for compression leaks. 2. Change fuel filter. 3. Refill tank with proper grade of fuel. 4. Check glow plug for looseness. Tighten or replace glow plug as necessary. 5. Visually check for cracks and listen for leaks around cylinder head. Notify field maintenance if a leak is found. 6. Visually check for cracks and listen for leaks around engine block. 7. If any defects are found, or if above steps DO NOT correct malfunction, notify field maintenance.

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
Engine runs rough.	<p>Fuel level in fuel tank is low.</p> <p>Fuel is in fuel filter.</p> <p>Jet start cock on air intake manifold is loose.</p> <p>Decompression valve handle is downward in closed position.</p> <p>Fuel filter is contaminated or filter block is clogged.</p> <p>Air cleaner is clogged or dirty.</p> <p>Fuel lines are blocked.</p> <p>Air intake manifold has blockage or holes.</p> <p>Nozzle holder is loose or blocked.</p> <p>Compression is low.</p>	<p>1. Add proper grade of fuel to fuel tank.</p> <p>1. Turn fuel petcock to OPEN position.</p> <p>1. Tighten thumbscrew on jet start cock.</p> <p>1. Turn decompression valve handle downward to closed position.</p> <p>1. Disassemble fuel filter and filter block and check for blockage.</p> <p>2. If blocked, clear passages and reinstall fuel filter and filter block.</p> <p>3. If contaminated, replace fuel filter and reinstall filter block.</p> <p>1. If air cleaner is clogged or dirty, clean or replace air cleaner.</p> <p>1. Remove fuel line and check for blockage.</p> <p>2. Clear blockage.</p> <p>3. Replace fuel line as required.</p> <p>1. Disassemble air intake manifold.</p> <p>2. Inspect and clear blocked passages.</p> <p>3. Replace air intake manifold as required.</p> <p>1. If nozzle holder is loose, tighten nozzle holder.</p> <p>2. If nozzle holder is blocked, clear any blocked passages and reinstall or replace nozzle holder.</p> <p>1. Listen for compression leaks.</p> <p>2. Change fuel filter.</p> <p>3. Refill tank with proper grade of fuel.</p> <p>4. Check glow plug for looseness. Tighten or replace glow plug as necessary.</p> <p>5. Visually check for cracks and listen for leaks around cylinder head. Notify field maintenance if a leak is found.</p> <p>6. Visually check for cracks and listen for leaks around engine block.</p> <p>7. If any defects are found, or if above steps DO NOT correct malfunction, notify field maintenance.</p>

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
Engine has insufficient output or "low power."	Fuel filter is contaminated or filter block is clogged.	<ol style="list-style-type: none"> 1. Disassemble fuel filter and filter block and check for blockage. 2. If blocked, clear passages and reinstall fuel filter and filter block. 3. If contaminated, replace fuel filter and reinstall filter block.
	Fuel is contaminated or discolored.	<ol style="list-style-type: none"> 1. Drain and flush tank. 2. Change fuel filter. 3. Refill tank with proper grade of fuel.
	Injector pump is loose or leaking.	<ol style="list-style-type: none"> 1. If injector pump is loose or leaking or if above steps DO NOT correct malfunction, notify field maintenance.
White or blue exhaust smoke is observed after warmup.	Excessive engine oil in crankcase.	<ol style="list-style-type: none"> 1. Drain oil to correct level. 2. Check oil for odor of fuel. 3. If fuel odor is found, notify field maintenance.
	Compression is low.	<ol style="list-style-type: none"> 1. Listen for compression leaks. 2. Change fuel filter. 3. Refill tank with proper grade of fuel. 4. Check glow plug for looseness. Tighten or replace glow plug as necessary. 5. Visually check for cracks and listen for leaks around cylinder head. Notify field maintenance if a leak is found. 6. Visually check for cracks and listen for leaks around engine block. 7. If any defects are found, or if above steps DO NOT correct malfunction, notify field maintenance.
Black or dark gray exhaust smoke is observed after warmup.	Fuel is contaminated or discolored.	<ol style="list-style-type: none"> 1. Drain and flush tank. 2. Replace fuel filter and refill fuel tank with proper grade of fuel.
	Fuel lines are blocked.	<ol style="list-style-type: none"> 1. Remove fuel lines and check for blockage. 2. Clear blockage. 3. Replace fuel lines as required.
	Fuel filter is contaminated or filter block is clogged.	<ol style="list-style-type: none"> 1. Disassemble fuel filter and filter block and check for blockage. 2. If blocked, clear passages and reinstall fuel filter and filter block. 3. If contaminated, replace fuel filter and reinstall filter block.

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
Low oil pressure indicator light is lit.	Oil level is low in crankcase.	1. Replenish crankcase with proper grade of oil. The level should be between bottom and top marks on oil level gauge (dipstick).
Oil pressure is low.	Oil level is low.	2. If oil was added and oil pressure indicator light is lit, notify field maintenance to check for low oil pressure.
	Oil filter is clogged.	1. Pull out engine oil dipstick and check oil level.
	Oil leaks.	2. Add or change engine oil with proper grade oil.
	Compression is low.	1. Remove oil filter and check for clogs and debris.
		2. If clogged, clean or replace oil filter.
		1. Visually check for oil leaks at head, oil pump, gear covers, and access plate gaskets.
		2. If any leaks are found, replace APU.
		1. Check for low compression and listen for compression leaks.
		2. Check glow plug for looseness. Tighten or replace glow plug as necessary.
		3. Check nozzle holder for looseness. Tighten or replace as necessary.
		4. Visually check for cracks in cylinder head and in engine block.
		5. If any cracks are found, replace APU.
Oil consumption is excessive.	Excessive oil consumption over 1 pint (0.5 l) per 250 hours of operation.	1. Visually check for oil leaks at head, gear covers, and access plate gaskets.
Fuel is mixed in with the lubricant oil.	Engine oil smells like diesel fuel.	2. If any leaks are found, replace APU.
Engine coolant is mixed in lubricant oil.	Engine oil is contaminated by coolant.	1. Notify field maintenance.
Engine is overheating.	Engine coolant level is low.	1. Drain and remove radiator.
	Oil level in crankcase is low.	2. Visually check for defective head gasket and cracks in cylinder block and cylinder head.
	Engine coolant has improper mixture.	3. If engine oil is contaminated by coolant, replace APU.
	Radiator or fan dynamo contains dirt and debris.	1. Add coolant as required.
		1. Replenish crankcase with proper grade of oil. The level should be between bottom and top marks on oil level gauge (dipstick).
		2. If oil was added and oil pressure indicator light is lit, notify field maintenance to check for low oil pressure.
		1. Add coolant as required.
		1. Clean and/or replace radiator and fan dynamo.

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
Battery has low charge. Battery will not hold charge.	Radiator cap is defective.	1. Visually check radiator cap for leakage and worn cap or gasket. 2. If any defects are found, replace radiator cap.
	Radiator is malfunctioning.	1. Check inside of radiator and inspect coolant solution for corrosion, rust, or discoloration. 2. If any defects are found, replace radiator cap. 3. Drain fluid from radiator. 4. Flush radiator and check for internal corrosion and deterioration. 5. If radiator is damaged, replace radiator. 6. Refill radiator with proper coolant mixture.
	Fan belt is loose or broken.	1. Adjust or replace fan belt.
	Fuel or oil is mixed in engine coolant.	1. Check for odor of fuel or oil mixed in engine coolant. 2. Drain engine coolant. 3. Inspect for fuel and oil contamination in engine coolant. 4. If contaminants are found, replace APU.
	Engine water jacket is corroded.	1. Remove radiator and check engine water jacket for corrosion. 2. Flush and clean engine water jacket. 3. If above steps DO NOT correct malfunction, replace APU.
	Battery connections are loose.	1. Check battery connections for looseness or corrosion. 2. Tighten connections.
	Fluid level in battery is low.	1. Check electrolyte level and specific gravity in each cell. 2. Replenish battery cells to proper level with distilled water and recharge as required. 3. Check battery electrolyte for improper specific gravity with hydrometer. 4. Charge or replace battery.
	Fan belt is faulty.	1. Check for fan belt slippage, excessive wear, or noisy operation. 2. Adjust fan belt tension. 3. Replace fan belt.
	Fan dynamo is faulty.	1. Check for noisy or vibrating fan dynamo. 2. Remove and replace fan dynamo.
	APU harness is faulty.	1. Check APU harness for breaks, corrosion, and burns on harness. 2. Remove and repair or replace APU wiring harness.

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION																					
Auxiliary Power Unit (APU) charging circuit fails to keep battery charged.	Current limiter leads in APU control box are faulty.	<div><div>3. If solar battery charger is installed, ensure that leads are securely attached to battery terminal.</div><div>1. Using an electrical tester (multimeter)on appropriate setting to read 1 to 1.4k resistance, check current limiter for conductivity by tagging, disconnecting, and probing three current limiter leads in APU control box.</div><div>2. If results are different than specified in Table 1, remove and replace current limiter.</div></div> <div><div>Table 1. APU Control Box Current Limiter Leads.</div><table><tr><th>Negative Lead</th><th>Positive Lead</th><th>Results (ohms)</th></tr><tr><td>Red/white</td><td>Red</td><td>Nonconductive</td></tr><tr><td></td><td>Blue</td><td>1k - 1.4k</td></tr><tr><td></td><td>Case</td><td>Nonconductive</td></tr><tr><td>Red</td><td>Blue</td><td>Nonconductive</td></tr><tr><td></td><td>Case</td><td>Nonconductive</td></tr><tr><td>Blue</td><td>Case</td><td>Nonconductive</td></tr></table></div>	Negative Lead	Positive Lead	Results (ohms)	Red/white	Red	Nonconductive		Blue	1k - 1.4k		Case	Nonconductive	Red	Blue	Nonconductive		Case	Nonconductive	Blue	Case	Nonconductive
	Negative Lead	Positive Lead	Results (ohms)																				
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	Case	Nonconductive																					
Blue	Case	Nonconductive																					
	Battery will not hold a charge. Battery voltage.	<div>1. Check that battery will hold a charge.</div> <div><div>1. Start and run APU.</div><div>2. Run APU for several minutes in order for charging circuit to stabilize; otherwise, indications measured may not be accurate.</div><div>3. Using an electrical tester (multimeter) (WP 0168) on a 20 VDC setting or greater, measure battery voltage by placing negative (-) probe on battery ground post (-) and placing positive (+) probe on battery positive (+) post.</div><div>4. Check that battery voltage with APU running measures 13 VDC ±2 VDC.</div><div>5. If battery voltage measures less than 11 VDC, check fan dynamo AC output by disconnecting leads from dynamo and measuring minimum of 13 VDC between each of two yellow leads and red lead.</div><div>6. If voltages are not present, shut down APU and remove and replace fan dynamo.</div><div>7. If voltages are present, check bridge rectifier.</div><div>8. If solar battery charger is installed, ensure that leads are securely attached to battery terminal.</div></div>																					

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION															
Glow plug heats slowly or fails to heat.	Bridge rectifier leads in APU control box are faulty.	<div><div><div>1. With APU control box cover removed, tag and disconnect four leads (red, red, white, and blue) from bridge rectif er.</div><div>2. Check conductivity across diodes within rectifier with an electrical tester (multimeter) set on lowest resistance setting. Probe four bridge rectifier leads.</div><div>3. If actual readings are different than readings specified in Table 2, remove and replace bridge rectifier.</div></div><div><div>Table 2. APU Control Box Bridge Rectifier Leads.</div><table><tr><th>Negative Lead</th><th>Positive Lead</th><th>Results (ohms)</th></tr><tr><td>Red (both leads)</td><td>White</td><td>Nonconductive</td></tr><tr><td>White</td><td>Red (both leads)</td><td>Conductive</td></tr><tr><td>Blue</td><td>Red (both leads)</td><td>Nonconductive</td></tr><tr><td>Red (both leads)</td><td>Blue</td><td>Conductive</td></tr></table></div></div>	Negative Lead	Positive Lead	Results (ohms)	Red (both leads)	White	Nonconductive	White	Red (both leads)	Conductive	Blue	Red (both leads)	Nonconductive	Red (both leads)	Blue	Conductive
	Negative Lead	Positive Lead	Results (ohms)														
	Red (both leads)	White	Nonconductive														
	White	Red (both leads)	Conductive														
	Blue	Red (both leads)	Nonconductive														
Red (both leads)	Blue	Conductive															
Glow plug heats slowly or fails to heat.	Battery connections are loose.	<div>1. Tighten connections.</div>															
	Battery connections are corroded.	<div>1. If battery connections are corroded, notify field maintenance.</div>															
	Fluid level in battery is low.	<div><div>1. Check electrolyte level and specific gravity in each cell.</div><div>2. Replenish battery cells to proper level with distilled water and recharge as required.</div><div>3. Check battery electrolyte for improper specific gravity with hydrometer.</div><div>4. Charge or replace battery.</div></div>															
	Battery is discharged or defective.	<div>1. Charge or replace battery.</div>															
	GLOW indicator lamp does not light within 5 to 20 seconds.	<div><div>NOTE</div><div>On the APU, with the APU engine serial number 504697 and subsequent numbers, the glow plug indicator is changed from GLOW type indicator to LAMP type, driven by a timer.</div><div><div>1. For glow-type glow plug indicator, hold starter switch in GLOW position and observe glow plug indicator element.</div><div>2. If glow plug indicator element fails to glow within 20 seconds (will take noticeably longer in very cold weather), remove wire from glow plug and hold wire terminal to APU frame to ground that wire.</div></div></div>															

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
APU jump start system is inoperable.		<ol style="list-style-type: none"> 3. If element fails to glow, replace APU control box glow plug indicator. 4. If element glows, replace glow plug. 5. For lamp-type glow plug indicator, hold starter switch in GLOW position for more than 5 seconds. Glow plug indicator will light, remain lit for about 5 seconds, and then extinguish. 6. If glow plug does not heat up, use multimeter to check for +12 VDC at glow plug terminal with respect to engine or frame. If voltage is present, replace glow plug. If voltage is not present, check for defective APU wiring harness. 7. If glow plug indicator does not light, check bulb, electrical connections, and timer. 8. If glow plug indicator lights and does not extinguish in approximately 5 seconds, replace timer.
	Defective APU wiring harness.	<ol style="list-style-type: none"> 1. Check APU wiring harness for broken, corroded, and burned wiring and loose electrical connections. 2. Repair or replace APU wiring harness.
	APU starter switch is defective.	<ol style="list-style-type: none"> 1. Replace starter switch.
	Auxiliary start system safety circuit module is inoperable.	<ol style="list-style-type: none"> 1. Press test switch button on safety circuit module. If an audible "click" is not heard, proceed to Proper Battery Installation below. 2. If an audible "click" is heard and APU does not crank over, notify field maintenance.
	Battery is not properly connected with the tractor.	<ol style="list-style-type: none"> 1. Check for proper 12 VDC connection at tractor 12/24 VDC series parallel battery installation (WP 0020). 2. Check clamp connections to tractor batteries. Ensure red positive (+) clamp is making good connection to battery terminal and that black negative clamp (-) is making good connection to tractor frame.
	Jumper cables are defective.	<ol style="list-style-type: none"> 1. Check jumper cables for loose clamps and connectors, fraying and corrosion, kinks, and damage. 2. Remove and repair or replace defective cables. 3. Check APU jump start electrical cables connected to APU (grounding and battery (positive terminal) for corrosion, loose clamps and connectors, and fraying. 4. Clean off corrosion and tighten any loose connections, and/or remove and replace defective electrical cables.
	APU jump start electrical box malfunction.	<ol style="list-style-type: none"> 1. Check that APU jump start electrical box and internal components are working properly by pressing test switch button on electrical box. 2. If an audible clicking sound is not heard and all of above checks/inspections have not corrected

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
		the problem, remove and replace APU jump start electrical box.

END OF WORK PACKAGE

FIELD MAINTENANCE

HYDRAULIC SYSTEM TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required

2

References

WP 0004
WP 0007
WP 0008
WP 0010
WP 0011


WP 0012
WP 0013
WP 0014
WP 0043
WP 0169
WP 0170
Electrical Schematic FO-5 and FO-6

INTRODUCTION

This work package covers hydraulic system troubleshooting.

Table 1. Hydraulic System.

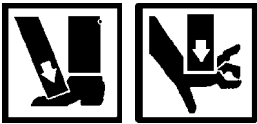
SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
General hydraulic failures.	<p>Auxiliary Power Unit (APU) is not running properly.</p> <p>Hydraulic hose has defects.</p> <p>System pressure gauge has faulty reading.</p>	<p style="text-align: center;"><u>CAUTION</u></p> <p>If APU has run longer than 30 seconds with the hydraulic tank shutoff valve closed, the pump may be damaged and the hydraulic system, including filters, may be contaminated with metal particles.</p> <ol style="list-style-type: none"> 1. Check that APU is running. 2. Start and run APU. 3. Check that hydraulic tank SHUTOFF valve is open. 4. Check fluid level in hydraulic tank. 5. Check and/or fill hydraulic tank as required. 6. Check hydraulic filter indicator. 7. Indicator should read in green; if it does not, remove and replace filter. 8. Check for external leaks at hydraulic fitting/joints. 9. Check hydraulic tank breather cap for restrictions. Replace cap if necessary. 1. Using hydraulic schematic (Figure FO-5 and FO-6) as a guide, operate all semitrailer hydraulics and check hydraulic hoses for internal collapse or obstructions. 2. Remove, repair, or replace hoses as necessary. 1. Check that system pressure gauge (WP 0004) does not read higher than 200 psi (1379 kPa) without hydraulic controls being operated. 2. If system pressure is higher than 200 psi (1379 kPa), continue checking pressure.

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
External leaks.	<p>Hydraulic pump malfunctions.</p> <p>Hydraulic fitting/joint leaks.</p>	<ol style="list-style-type: none"> Check that system pressure gauge does not read less than 100 psi (690 kPa) without hydraulic controls being operated. Check hydraulic tank filter for obstructions or contamination. Clean or replace hydraulic tank filter (WP 0043). Check hydraulic pump's ability to develop pressure by operating front curbside suspension handle downward. Monitor system pressure gauge. Hydraulic pressure should quickly reach from 3,800 to 4,500 psi (26,201 to 31,027 kPa). If pressure rises quickly but fails to reach 3,800 to 4,500 psi (26,201 to 31,027 kPa), check to see if system will maintain normal or adequate operating pressure. If pressure rises quickly, check non-operating function by using Symptom Index (WP 0028) to continue troubleshooting. <p><u>WARNING</u></p>  <p>Steering and suspension system hydraulic lines are under pressure even when APU is not running. DO NOT attempt to tighten, loosen, adjust, or repair fitting, line, or hoses until semitrailer is supported by support legs (WP 0011 and WP 0012) and all pressure is relieved. Failure to follow this warning may result in injury to personnel.</p> <p><u>CAUTION</u></p> <p>While performing hydraulic maintenance, it is important to accurately tag both ends of a hose or tube and associated fitting. When removing or installing any hydraulic hoses or tubes, use two wrenches, one to hold the fitting and one to turn the hose or tube, or damage to equipment may result.</p> <ol style="list-style-type: none"> Check tightness of fitting and tighten as necessary. Disassemble and inspect for any fitting's metal-to-metal seal problems, defects in surface texture of flares, and pitting or breaks. Reassemble joints using pipe sealant (WP 0170) as required for pipe threaded fitting.

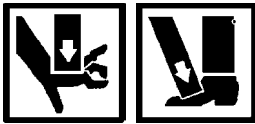

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
System will not maintain normal or adequate operating pressure.	Hoses are damaged.	<ol style="list-style-type: none"> 4. If joint still leaks, replace parts as necessary. 1. Inspect for split or ruptured hydraulic hoses and lines. 2. If a hose needs to be repaired or replaced, remove defective hose and notify field maintenance.
	External cylinder leaks.	<ol style="list-style-type: none"> 1. Check for external cylinder leaks. 2. If fluid is leaking out around cylinder rod, wipe down cylinder rod with rag and exercise affected cylinder full travel in each direction for three cycles. 3. If leakage slows/stops, monitor. If leakage continues, notify field maintenance.
	General hydraulic failures.	<ol style="list-style-type: none"> 1. Refer to previous symptom, General Hydraulic Failures, for checking hydraulic failures.
	Hydraulic fittings/joints have external leaks.	<ol style="list-style-type: none"> 1. Refer to previous symptom, External Leaks, for checking external leaks.
	System pressure gauge reading is abnormal.	<ol style="list-style-type: none"> 1. After initial startup, check that system pressure gauge reads up to 500 psi (3,448 kPa) without hydraulic controls operated. 2. Check if outside ambient temperature is below 30°F (-1°C). 3. Hydraulic pressure will normally be higher until hydraulic fluid warms to normal operating temperature. A gradual decrease in pressure should occur as hydraulic systems are operated.
	Isolation valves are inoperable.	<ol style="list-style-type: none"> 1. Check that all isolation valves are in normal operating position. 2. Ensure valve handle operates all associated valve stems. 3. If a valve stem is rounded off or the valve is defective, replace valve as required. 4. Check that gooseneck isolation valve is in proper position for load conditions. 5. If semitrailer was moved or loaded while in ADJUST mode, suspension circuits may be overloaded. Lower all four support legs and relieve pressure from suspension circuits by lowering platform onto support legs (WP 0011 and WP 0012). 6. If in ADJUST mode, check that front support legs are lowered to the ground and supporting most of the load.
	Platform, with or without payload, is not level.	<ol style="list-style-type: none"> 1. Lower front and rear support legs (WP 0011 and WP 0012). 2. Readjust platform height to have weight supported by support legs and to ensure platform is as level as possible.


SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
Pump is making excessive noise or pump has failed.	Control valve handles are inoperable.	<ol style="list-style-type: none"> 1. Check for partially shifted or stuck control valve handles on steering gooseneck and suspension control (WP 0004). 2. Operate hydraulic control valves and check for ability of valves to return to center (neutral position). Be sure valve handles move freely and DO NOT bind. 3. Operate suspected control valve slowly and monitor gauge for pressure changes. 4. If pressure changes occur, valve body may be contaminated, defective, or leaking internally. Perform general system flushing to try and remove any contaminants further in system. 5. If symptom still exists, remove and repair or replace handles as required.
	Hydraulic controls are inoperable.	<ol style="list-style-type: none"> 1. Operate all hydraulic controls and adjust gooseneck (WP 0007). 2. Adjust platform (WP 0008). 3. Manually adjust steering (WP 0010). 4. Identify which hydraulic control is unable to achieve normal hydraulic pressure during operation, and use Symptom Index (WP 0028) for quick reference to continue troubleshooting
	Hydraulic pump fails.	<p style="text-align: center;"><u>CAUTION</u></p> <p>If APU has run longer than 30 seconds, with the hydraulic tank SHUTOFF valve closed, pump may be damaged and the hydraulic system, including filters, may be contaminated with metal particles.</p> <ol style="list-style-type: none"> 1. Check that hydraulic tank SHUTOFF valve is open (WP 0004). 2. If hydraulic tank SHUTOFF valve was closed with APU running, check hydraulic filter indicator to determine how much contamination has moved away from hydraulic pump (WP 0107). If filter is not clogged, contamination has not reached filter. 3. Remove filter supply line, filter assembly, and supply hoses from pump, gooseneck, and step assembly. Remove and replace pump. 4. Clean all fittings, hoses, and filter parts. Replace all parts as required. 5. If contamination has clogged filter, some contamination may have passed filter and moved in hydraulic system. Refer to hydraulic flushing procedure and flush hydraulic system. 6. Check that hydraulic system will maintain proper operating pressure.


SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
Platform suspension will not adjust or adjustments are sluggish.	<p>General hydraulic failures.</p> <p>Suspension isolation valves are improperly positioned.</p> <p>Suspension SHUTOFF and gooseneck isolation valves are improperly positioned.</p> <p>External leaks at hydraulic fittings/joints.</p> <p>Insufficient suspension pressure.</p>	<p>7. Check for external leaks at hydraulic fittings/joints.</p> <p>1. Refer to General Hydraulic Failures.</p> <p>1. Check that all suspension isolation valves are in OPEN position.</p> <p>2. Position isolation valves in open position, handles pushed inward and facing toward front of semitrailer.</p> <p>1. Check that suspension SHUTOFF and gooseneck isolation valves are in correct position (WP 0004).</p> <p>2. If coupled to a tractor, set suspension SHUTOFF and gooseneck isolation valve handles in RUN position, both handles pushed inward.</p> <p>3. Pull out suspension SHUTOFF valve to make platform adjustments.</p> <p>4. If uncoupled from a tractor, suspension SHUTOFF valve handle and gooseneck isolation valve handle should be in ADJUST position, both handles pulled outward.</p> <p>1. Refer External Leaks to continue checking for external leaks.</p> <p>1. Check suspension pressure while trying to adjust platform.</p> <p>2. If all three suspension gauges fail to reach pressures above 3,800 psi (26,201 kPa), or if system pressure gauge reads lower than suspension gauges or lower than normal pressure for current payload condition while trying to adjust platform, check system supply.</p> <p>3. If only one suspension circuit fails to reach 3,800 psi (26,201 kPa), and the other two suspension circuits operate normally, check for signs of external leakage or ruptured hoses.</p> <p>4. Identify failed hydraulic circuit and use Symptom Index (WP 0028) to continue troubleshooting.</p>


SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
Platform suspension drifts down or drops.	Linkage at gooseneck isolation valve is loose.	<p><u>WARNING</u></p>  <p>Ensure all four support legs are lowered and supporting the platform prior to checking the gooseneck isolation valve handles for proper operation or injury to personnel may result (WP 0011 and Y R'0012).</p> <ol style="list-style-type: none"> Linkage should be tight and adjusted so that all valve handles move the same distance and open each valve equally. Adjust valve linkage as required. Check each valve handle to be sure both valves are being operated. Tighten or remove and replace defective parts.
	Suspension adjustments are sluggish or slow within suspension circuit.	<ol style="list-style-type: none"> Check to see if counterbalance valves are dirty, leaking, or defective. Remove counterbalance valves CB1 (front suspension curbside), CB2 (front suspension streetside), or CB3 (rear suspension) from suspension control manifold. Clean and/or replace items removed. Check to see if flow control valves are dirty or defective. Remove flow control valves FC1 (front suspension curbside), FC2 (front suspension streetside), or FC3 (rear suspension) from suspension control manifold. Clean and/or replace items removed.
	Leaking or damaged hydraulic cylinder.	<ol style="list-style-type: none"> If cylinder is damaged, remove and replace suspension hydraulic cylinder. If cylinder is leaking, notify field maintenance.
	General hydraulic failures.	<ol style="list-style-type: none"> Refer to General Hydraulic Failures.
	External leaks at hydraulic fittings/joints.	<ol style="list-style-type: none"> Refer to checking external leaks.
	Suspension cylinder, line fracture valves, suspension isolation valves, suspension valves, gooseneck cylinders, and/or hydraulic gauges are leaking.	<ol style="list-style-type: none"> Check for evidence of leakage at suspension cylinder, line fracture valves, suspension isolation valves, suspension valves, gooseneck cylinders, and hydraulic gauges. If components are damaged, remove and replace components as required. If cylinders are leaking, notify field maintenance.

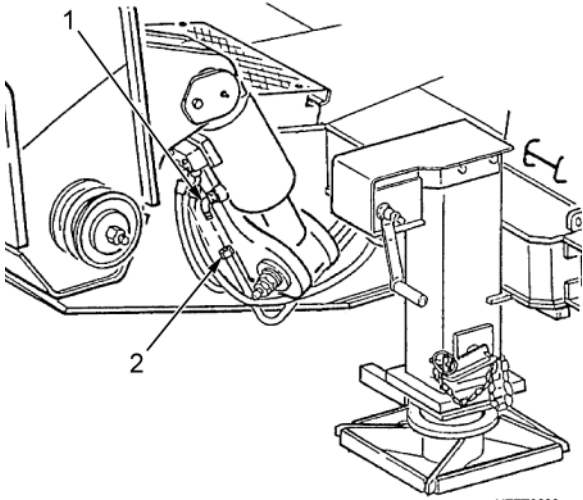
SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
Suspension rides stiff and does not adjust for bumps/road hazards.	Gooseneck isolation valve is leaking internally.	<ol style="list-style-type: none"> 1. Check drift between gooseneck cylinders and front suspension cylinders while gooseneck isolation valve is in ADJUST mode only. 2. If gooseneck cylinders extend about 0.25 to 0.5 in. (0.6 to 1.2 cm) at the same rate as suspension cylinders retract, gooseneck isolation valve may be leaking internally. Remove gooseneck isolation valve and check and replace parts found defective.
	Pilot check valves in suspension control manifold are contaminated or leaking.	<ol style="list-style-type: none"> 1. Check platform drift in front suspension while gooseneck isolation valve is in RUN mode by uncoupling tractor and semitrailer while in ADJUST mode with front support legs 3 in. (7.6 cm) off the ground. Pilot check valves in suspension control manifold may be contaminated or leaking. 2. Clear contamination by raising platform to near full height and lowering platform to near fully lowered for three or more full cycles of operation. 3. While raising and lowering platform, abruptly release and reverse handles several times each cycle. 4. If platform drifts downward at a steady or even rate, counterbalance valves CB1 (curbside) and CB2 (streetside) may be leaking internally or around valves. Remove and clean valves. 5. Reinstall valves and recheck operation. 6. Remove suspension control manifold. 7. Clean and repair or replace parts as necessary.
	Improper platform height over rough/rugged terrain.	<ol style="list-style-type: none"> 1. Check platform height. Height should be 43 in. (109 cm). 2. Make required adjustments to platform (WP 0008).
	Suspension isolation valve is positioned improperly.	<ol style="list-style-type: none"> 1. Check that axle suspension isolation valve is open. 2. Open isolation valve, handles facing forward toward front of semitrailer. 3. Check that suspension isolation valve handle operates both valves equally and is secure. Tighten or remove and replace defective parts. 4. Tighten or remove and replace defective parts.

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
	Gooseneck isolation valve is positioned improperly.	<p><u>WARNING</u></p>  <p>Ensure all four support legs are lowered and supporting the platform prior to checking the gooseneck isolation valve handles for proper operation. Failure to follow this warning may result in injury to personnel.</p> <ol style="list-style-type: none"> 1. For highway driving or when semitrailer and tractor are coupled, check that gooseneck isolation valve is pushed inward to RUN position. 2. Linkage should be tight and adjusted so that all valve handles move the same distance and open each valve equally. Adjust valve linkage as required. 3. Check each valve handle to be sure both valves are being operated. Tighten or remove and replace defective parts. 1. Inspect areas of damage; try to determine probable cause; and repair and/or replace parts as necessary.
Suspension tire change chain is overstressed and/or breaks.	<p>Damage or mechanical binding at is found at suspension arms and suspension cylinders and at gooseneck pivot pin and gooseneck cylinders.</p> <p>Suspension isolation valve is positioned improperly.</p>	<p><u>WARNING</u></p>  <p>Ensure all four support legs (WP 0011 and WP 0012) are lowered and supporting the platform prior to checking the suspension isolation valves for leaks. Failure to follow this warning may result in injury to personnel.</p> <ol style="list-style-type: none"> 1. Check that affected suspension isolation valve is closed. 2. Operate affected suspension isolation valve and check that valve handle operates both valves equally and is secure. 3. Tighten or remove and replace defective parts. 4. Check for possible leakage at suspension isolation valve.


SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
Gooseneck will not adjust or adjustments are sluggish.	Leakage is found at suspension isolation valve.	<p><u>WARNING</u></p>  <p>Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets in the eyes, flush them immediately with water and seek medical attention. If hydraulic fluid gets on skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking. Failure to follow this warning may result in injury to personnel.</p> <ol style="list-style-type: none"> 1. Check for external leaks at suspension isolation valve fitting, stem area, or hoses. If leaking, notify field maintenance. 2. Disassemble hose/tube from fitting and reassemble hose/tube using pipe sealant (WP 0170). If joint still leaks, replace parts as necessary.
	General hydraulic failures.	<ol style="list-style-type: none"> 1. Refer to General Hydraulic Failures.
	Semitrailer kingpins are not completely uncoupled.	<p><u>CAUTION</u></p> <p>DO NOT attempt to adjust gooseneck while it is coupled to a tractor. The gooseneck may lift the tractor/front of platform and may cause damage to equipment.</p> <ol style="list-style-type: none"> 1. Check that semitrailer kingpins are completely uncoupled and are clear of tractor fifth-wheel. 2. If kingpins are hitting fifth-wheel, pull tractor ahead slightly to allow kingpin to clear fifth-wheel and vee-entry ramps without binding.
	Suspension SHUTOFF and gooseneck isolation valves are positioned incorrectly.	<ol style="list-style-type: none"> 1. Check that suspension SHUTOFF and gooseneck isolation valves are in the correct position. 2. Suspension SHUTOFF valve handle and gooseneck isolation valve handle should be in ADJUST position, both handles pulled outboard.

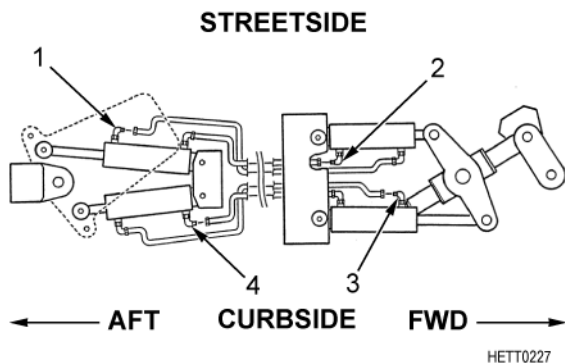
SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
	Linkage at gooseneck isolation valve is incorrect.	<p><u>WARNING</u></p>  <p>Ensure all four support legs (WP 0011 and WP 0012) are lowered and supporting the platform prior to checking the gooseneck isolation valve handles for proper operation. Failure to follow this warning may result in injury to personnel.</p> <ol style="list-style-type: none"> 1. Check linkage at gooseneck isolation valve for binding, missing parts, loose connections, and improper linkage travel. 2. Linkage should be tight and adjusted so that all valve handles move the same distance and open each valve equally. Adjust valve linkage as required. 3. Check each valve handle to be sure both valves are being operated. Tighten or remove and replace defective parts.
	Gooseneck/suspension system has external leakage.	<p><u>CAUTION</u></p> <p>External leakage in the gooseneck/suspension system may have caused one or more line fracture valves to close. Further operation without resetting the line fracture valve may cause component overload and premature failure.</p> <ol style="list-style-type: none"> 1. Check for possible closed line fracture valve on a suspected gooseneck cylinder by checking both hoses for equal pressure (stiffness) by bending and observing suspected hoses. 2. If unequal pressure is found in one of the hoses, one side of line fracture valve may have closed. Check for external leaks in gooseneck cylinder and reset line fracture valve by lowering gooseneck to lowest position and holding in downward position for a minimum of 15 seconds (WP 0007). 3. If line fracture valve cannot be reset, remove and replace line fracture valve.
	System pressure is inadequate.	<ol style="list-style-type: none"> 1. Check that system pressure gauge reads less than 1,000 psi (6,895 kPa) while trying to lower gooseneck. 2. Check gooseneck control valve section of four-way directional control valve for internal leaks or contamination. 3. Remove, clean, and repair or replace parts as necessary.

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
Gooseneck drifts down, drops, or will not support itself.	Gooseneck isolation valve is incorrectly positioned. Evidence of leakage is found.	<ol style="list-style-type: none"> 4. Check that system pressure does not exceed 1,500 psi (10,342 kPa) while trying to raise the gooseneck. 5. Check for mechanical obstructions or damage to gooseneck cylinders or gooseneck pivot. If defective, notify field maintenance. 1. If uncoupled from a tractor, gooseneck isolation valve handle should be in ADJUST position. 1. Check for evidence of leakage at gooseneck cylinder rod seals, line fracture valves, gooseneck control valve, and gooseneck isolation valves. 2. Repair or replace parts found defective as required. 3. If gooseneck cylinder is leaking, notify field maintenance.
	Linkage at gooseneck isolation valve is incorrect.	<p><u>WARNING</u></p>  <p>Ensure all four support legs (WP 0011 and WP 0012) are lowered and supporting the platform prior to checking the gooseneck isolation valve handles for proper operation. Failure to follow this warning may result in injury to personnel.</p> <ol style="list-style-type: none"> 1. Check linkage at gooseneck isolation valve for binding, missing parts, loose connections, and improper linkage travel. 2. Linkage should be tight and adjusted so that all valve handles move the same distance and open each valve equally. Adjust valve linkage as required. 3. Check each valve handle to be sure both valves are being operated. Tighten or remove and replace defective parts as required. 1. Check gooseneck drift while in the ADJUST mode by observing front suspension. 2. Lower front suspension. 3. If front suspension, streetside, and/or curbside is two or three times slower than normal cylinder speed, remove and inspect each respective side of gooseneck isolation valve and replace parts as necessary. 4. If gooseneck drifts and front suspension does not, check gooseneck cylinder for internal leakage as follows: <ol style="list-style-type: none"> a. Couple tractor/semitrailer.
	Gooseneck drifts.	

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
Oil or air is being relieved from gooseneck cylinder air reservoir.	Gooseneck cylinder air reservoir is damaged.	<ol style="list-style-type: none"> b. Operate gooseneck isolation valve handle to RUN position. c. Close hydraulic tank SHUTOFF valve, remove lower hose (Figure 1, Item 2) from each gooseneck cylinder, and cap line to prevent fluid loss. d. Check cylinder port (Figure 1, Item 1) for fluid loss while watching for platform drift down. Remove cap from line reconnect hoses to cylinder and open hydraulic tank SHUTOFF valve. <p>5. If platform drifted and fluid loss from cylinder port was approximately the same rate, cylinder(s) is leaking internally. Notify field maintenance to repair or replace gooseneck cylinder(s).</p>
Oil is dripping or running from relief valve or air breather/check valve		 <p>Figure 1. Gooseneck Cylinder Port and Hose.</p> <p>NOTE</p> <p>The air reservoir contains a small amount of oil to minimize corrosion. Some of the oil may escape through the relief valve or air breather valve during operation. Therefore, occasional dripping is not considered a malfunction.</p> <ol style="list-style-type: none"> 1. Check for dents, cracks, and damage to reservoir. 2. If damaged, remove and replace air reservoir. 1. Check reservoir for leaks. 2. If fittings are leaking remove and reinstall using pipe sealant.

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
Steering will not adjust.	at gooseneck cylinder air reservoir.	<ol style="list-style-type: none"> 3. If joint still leaks, replace parts as required. 4. If excessive oil relieves from air reservoir, it is possible that streetside gooseneck cylinder may be leaking internally. Refer to Gooseneck Drifts Down and Will Not Support Self and check streetside gooseneck cylinder for internal leaks.
	Brakes are released and steerable axles are blocked or obstructed.	<ol style="list-style-type: none"> 1. Release semitrailer brakes by operating brake release valve. 2. Move wheel chocks away from tires, or remove any debris or materials that may block the steerable axles from turning.
	Steering wedge is improperly seated with tractor fifth-wheel when coupled.	<ol style="list-style-type: none"> 1. Recouple tractor/semitrailer (WP 0013).
	Steering wedge is offset to extreme limits of travel when uncoupled.	<ol style="list-style-type: none"> 1. Adjust steering wedge (WP 0010).
	Steering pressure is abnormal.	<p style="text-align: center;">NOTE</p> <p>Normal pressures should read 1,000 to 2,500 psi (6,895 to 17,238 kPa) when steering wedge is approximately straight ahead. Pressure should rise up to 3,000 to 3,900 psi (20,685 to 26,891 kPa) when positioned for an extreme turn.</p> <ol style="list-style-type: none"> 1. Check for normal steering pressure at systems pressure gauge for adjusting steering. 2. If system pressure gauge reads higher than normal, check for mechanical binding, damage, hydraulic leaks, or misalignments of platform and gooseneck steering components. 3. If defects are found, adjust, repair, or replace parts as required. 4. If system pressure gauge reads normal but will not adjust when steering valve handle is operated, refer to Steering Will Not Maintain Normal or Adequate Operating Pressure and check system ability to maintain proper operating pressure. 5. If system pressure is low and steering will not adjust but semitrailer tracks tractor steering check each steering cylinder for internal leakage.

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
	<p>System pressure is low. Steering will not adjust but semitrailer tracks tractor steering.</p>	<p style="text-align: center;"><u>WARNING</u></p> <div style="text-align: center;">  </div> <ul style="list-style-type: none"> • Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets in the eyes, flush them immediately with water and seek medical attention. • If hydraulic fluid gets on skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking. • When checking for leaks, keep hands and face away from cylinder opening while under pressure. <p>Failure to follow these warnings may result in injury to personnel.</p> <ol style="list-style-type: none"> 1. Check each steering cylinder for internal leakage. 2. Manually steer semitrailer in a full right turn (WP 0014). 3. Disconnect and plug aft port on streetside gooseneck cylinder hydraulic hose (Figure 2, Item 2) and curbside platform cylinder hose (Figure 2, Item 4). 4. Disconnect and plug forward port on curbside gooseneck cylinder hydraulic hose (Figure 2, Item 3) and streetside platform cylinder hose (Figure 2, Item 1). 5. Continue to steer a right turn until system pressure gauge reads between 3,800 to 4,500 psi (26,201 to 31,027 kPa). 6. Check open ports for excess fluid leakage. If excess fluid loss is detected, remove leaking cylinder and notify field maintenance. 7. Remove plugs and reconnect hoses to cylinders.

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
Steering pressure indicator light comes on.	Steering system steers in one direction but system pressure gauge reads over 3,800 psi (26,201 kPa) and still does not adjust in the other direction.	<div>  <p style="text-align: center;">STREETSIDE</p> <p style="text-align: center;">← AFT CURBSIDE FWD →</p> <p style="text-align: right;">HETT0227</p> </div> <p style="text-align: center;">Figure 2. Steering Cylinders.</p> <ol style="list-style-type: none"> Steering manifold pilot check valves PO1 through PO4 may be leaking, may be defective, or may be failing to pilot. Remove pilot check valves. Clean, repair, or replace parts as required. Steering manifold resistance valve RV1 through RV8 may be stuck closed and/or open, and may be dirty or defective. Remove resistance valves. Clean, repair, or replace parts as required. Start APU and recharge steering hydraulic circuit. Operate steering control valve in both directions for approximately 10 seconds. Check for general hydraulic failures that would limit fluid flow to hydraulic controls. Refer to General Hydraulic Failures. Refer to General Hydraulic Failures for checking external leaks. Bleed and recharge hydraulic system to remove possible air trapped in hydraulic system. If relief valve R1 is not leaking or defective; or steering pressure indicator stays lit while adjusting steering with steering control valve; or steering pressure indicator comes on immediately when handle is released; use multimeter (WP 0169) to check which pressure switch closes first. If pressure switch PS5 closes first, check valve PO1 may be defective or leaking. If pressure switch PS6 closes first, check valve PO2 may be defective or leaking. If pressure switch PS7 closes first, check valve PO3 may be defective or leaking. If pressure switch PS8 closes first, check valve PO4 may be defective or leaking.
	Indicator light comes on. Semitrailer also has other malfunction symptoms, such as poor tracking behind tractor or steering will not adjust.	
	Hydraulic fittings/joints have external leaks.	
	Indicator light remains lit after numerous general hydraulic checks.	

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
Semitrailer steering does not track properly.	Steering wedge is not properly fitted and secure in the tractor fifth-wheel.	5. Repair or replace parts as required. 1. Uncouple tractor/semitrailer and then recouple (WP 0013).
	Steering cylinder, fitting, joint, and hoses have hydraulic leaks.	1. Refer to General Hydraulic Failures and check for external leaks.
	Steering pressure indicator light is lit.	1. Recharge hydraulic pressure to steering circuit by starting APU.
	Steering pressure indicator is not on.	2. Operate steering control valve in both directions. 1. Check indicator light for proper operation. 2. Refer to Electrical System/Steering Pressure Indicator Does Not Light to check steering indicator.
	Hydraulic system has excessive air.	1. Bleed steering system. 2. Test steering system for proper tracking.
	Steering pressure indicator light still comes on.	1. Refer to Steering Will Not Adjust and troubleshoot indicator light and pressure switches.
	Steering pressure indicator stays off and semitrailer still does not track the tractor properly.	1. Check platform steering installation for loose, misaligned, or broken parts. 2. Perform platform steering alignment as required.
	Steering cylinders leak.	1. Refer to Steering Will Not Adjust and check steering hydraulic cylinders for leaks.

END OF WORK PACKAGE

FIELD MAINTENANCE

ELECTRICAL SYSTEM TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required

1

WP 0046

WP 0047

WP 0052

References

WP 0013

WP 0035

WP 0045

WP 0168

Electrical Schematic FO-1 and FO-2

INTRODUCTION

This work package covers the electrical system troubleshooting.

Table 1. Electrical System.

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
Steering pressure indicator does not light when pressure is low.	Power is not supplied from tractor to running lights.	<ol style="list-style-type: none"> 1. Couple tractor/semitrailer (WP 0013). 2. Turn on semitrailer running lights. If lights DO NOT come on, check electrical connector for bent or missing pins and check electrical cable for pinched or broken lines or other damage. 3. Repair or replace parts as required. 4. If steering pressure indicator fails to light, refer to the symptom "None of the Lamps Light" below and check tractor/semitrailer electrical.
	Steering pressure indicator light bulb is not working.	<ol style="list-style-type: none"> 1. Using a 12 VDC battery and jumper leads, connect leads to poles of bulb. 2. If bulb is defective, replace bulb.
	Wiring to pressure switches is damaged.	<ol style="list-style-type: none"> 1. Check jumper wires to four pressure switches. 2. Check wiring harness W3 for breaks and for pinched or missing wires. 3. Repair or replace wiring.
		NOTE
		<ul style="list-style-type: none"> • Ensure the tractor/semitrailer is coupled and running lights are turned on. • If checking more than one pressure switch, recharge the steering circuit between each check by running the Auxiliary Power Unit (APU) and operating the steering valve for 10 seconds in both directions until indicator light goes out.
	Pressure switch on suspension manifold is defective.	<ol style="list-style-type: none"> 1. Using an electrical tester (multimeter) (WP 0168), check for defective pressure switch PS5 on suspension manifold.

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
		<ol style="list-style-type: none"> a. Using an ohm meter, connect leads to poles of pressure switch PS5. Reading on meter should be infinity (open). b. Check operation of pressure switch PS5 by slightly opening aft bleed valve on curbside platform cylinder. c. Allow only residual pressure to be bled from cylinder. Once pressure is relieved from cylinder, close bleed valve and check indicator light. Indicator light should be lit and ohm reading should be zero (closed). d. If indicator light is not lit, or ohm reading is not zero, replace pressure switch PS5. <ol style="list-style-type: none"> 2. Using an electrical tester (multimeter) (WP 0168), check for defective pressure switch PS6 on suspension manifold. <ol style="list-style-type: none"> a. Using an ohm meter, connect leads to poles of pressure switch PS6. Reading on meter should be infinity (open). b. Check operation of pressure switch PS6 by slightly opening forward bleed valve on curbside platform cylinder. c. Allow only residual pressure to be bled from cylinder. Once pressure is relieved from cylinder, close bleed valve and check indicator light. Indicator light should be lit and ohm reading should be zero (closed). d. If indicator light is not lit or ohm reading is not zero, replace pressure switch PS6. 3. Using an electrical tester (multimeter) (WP 0168), check for defective pressure switch PS7 on suspension manifold. <ol style="list-style-type: none"> a. Using an ohm meter, connect leads to poles of pressure switch PS7. Reading on meter should be infinity (open). b. Check operation of pressure switch PS7 by slightly opening forward bleed valve on streetside platform cylinder. c. Allow only residual pressure to be bled from cylinder. Once pressure is relieved from cylinder, close bleed valve and check indicator light. Indicator light should be lit and ohm reading should be zero (closed). d. If indicator light is not lit, or ohm reading is not zero, replace pressure switch PS7. 4. Using an electrical tester (multimeter) (WP 0168), check for defective pressure switch PS8 on suspension manifold.

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
None of the lamps light.	Lights are defective.	<ol style="list-style-type: none"> Using an ohm meter, connect leads to poles of pressure switch PS8. Reading on meter should be infinity (open). Check operation of pressure switch PS8 by slightly opening aft bleed valve on streetside platform cylinder. Allow only residual pressure to be bled from cylinder. Once pressure is relieved from cylinder, close bleed valve and check indicator light. Indicator light should be lit and ohm reading should be zero (closed). If indicator light is not lit, or ohm reading is not zero, replace pressure switch PS8. <ol style="list-style-type: none"> Check lights on tractor, including turn signals and stop lights. If towing vehicle lights DO NOT light, notify field maintenance.
	Inter-vehicular cable not properly connected.	<ol style="list-style-type: none"> Check that inter-vehicular cable is properly connected. If cable is not properly connected, reconnect cable.
	Inter-vehicular cables/connectors are corroded and defective.	<ol style="list-style-type: none"> Check connectors for dirty, corroded, or damaged pins (WP 0035). Using a multimeter (WP 0168) and semitrailer electrical schematic (Figure FO-1 and FO-2) as a guide, check for corroded inter-vehicle cable hookups. If cables are corroded, clean cables and reconnect as required. If cables are defective, replace cables as required.
	Wiring has a ground or open circuit.	<ol style="list-style-type: none"> Using a multimeter (WP 0168) and semitrailer electrical schematic (Figure FO-1 and FO-2) as a guide, check for ground or open circuit in wiring. If wiring has a ground or open circuit, repair or replace wiring as required.
One or more (but not all) lights will not light.	Lamps are burned out or defective.	<ol style="list-style-type: none"> Check for burned out or defective lamps (WP 0035). If lamps are burned out or defective, notify field maintenance.
	Lead wires are broken and connections are corroded and loose.	<ol style="list-style-type: none"> If connections are loose, tighten connections (WP 0035). If connections are corroded, clean connectors as required. If lead wires are broken, repair lead wires as required.

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
	Light assembly is defective.	1. Repair or replace defective light assemblies (WP 0046 through WP 0052).
	Semitrailer connectors J1 and J2 at gooseneck component assembly are faulty.	<ol style="list-style-type: none"> Using an electrical tester (multimeter) and semitrailer electrical schematic (Figure FO-1 and FO-2) as a guide, remove tractor inter-vehicle connectors and check semitrailer connectors J1 and J2 at gooseneck component assembly (WP 0045). At connector J1, using a multimeter on lowest ohm setting, connect common lead to ground. At connector, probe pins A, B, C, E, F, and H. Results should reflect greater than 3 ohms. Probe pins K, L, M, and N. Results should reflect open circuit. Probe pin D. Results should reflect ground. At connector J2, using a multimeter on lowest ohm setting, connect common lead to ground. At connector, probe pins 2 through 6. Results should reflect 1 ohm or greater. Probe pin 1. Results should reflect ground. Probe pin 7. Results should reflect open circuit.
	Wiring or terminal board has open circuit.	<ol style="list-style-type: none"> Using semitrailer electrical schematic (Figure FO-1 and FO-2), check for open circuit in wiring or terminal board. If wiring or terminal board has a ground or open circuit, repair or replace as required.
	Resistors and diodes have an open circuit.	<ol style="list-style-type: none"> At gooseneck component assembly, using an electrical tester (multimeter) (WP 0168), check resistors and diodes for open circuit. Remove six bolts and carefully remove gooseneck component assembly from gooseneck. Turn component assembly upside down for accessibility. Probe pins J1-B to J2-3; results should reflect 7 ohms. Probe pins J1-J to J2-5; results should reflect 7 ohms. Probe pins J1-E to TB2-1; results should reflect 2 ohms. <ol style="list-style-type: none"> For LED lights, this step is not applicable. Probe terminal boards TB2-1 to TB2-2; results should reflect continuity in one direction. Reverse leads and results should reflect resistance in other direction. Remove jumper wire from terminal board TB2-3 and probe pins TB2-1 to TB2-3. Results should reflect continuity in one direction. Reverse leads. Results should reflect resistance in other direction. Reinstall jumper wire to pin 3. <ol style="list-style-type: none"> For LED lights, probe terminal TB2-10 to TB2-2 for current flow. In the 10-2 direction, current should flow unresisted. In the 2-10 direction, less

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
Lights are dim or flickering.		than 12 volts should give an open circuit and greater than 12 volts should give a closed circuit.
		6. Remove and replace resistors and/or diodes (WP 0045).
		7. For LED lights, remove and replace diodes and/or zener lead assembly.
	Electrical connections have loose, dirty, or corroded pins.	1. If connections are loose, tighten connections (WP 0035).
	Lamp is defective.	2. If connector pins are dirty or corroded, notify field maintenance.
	Towing vehicle lights are inoperable.	1. Check for defective lamp (WP 0035).
	Output from tractor is improper.	2. If lamp is defective, notify field maintenance.
	Light assemblies have corrosion, missing parts, and burned bulbs.	1. If tractor has dim or flickering lights, notify field maintenance.
	Ground or open circuit is intermittent.	1. Repair or replace any defects found as required.
		1. Repair or replace defective light assemblies (WP 0047 and WP 0052).
		1. Using semitrailer electrical schematic (Figure FO-1 and FO-2) and multimeter, check for intermittent ground or open circuit.
		2. If wiring is defective, repair or replace as required.

END OF WORK PACKAGE

FIELD MAINTENANCE

WHEELS, TIRES, AND HUBS TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required

1

References

WP 0035

WP 0038

WP 0075

WP 0076

WP 0077

WP 0081


TM 9-2330-381-24P

INTRODUCTION

This work package covers wheels, tires, and hubs troubleshooting.

Table 1. Wheels, Tires, and Hubs.

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
Wheel is wobbling.	Lug nuts are loose and missing. Lugs are missing and broken.	<ol style="list-style-type: none"> 1. If lug nuts are loose or missing, replace and tighten. Torque as required (WP 0075). 2. If lug studs are broken or stripped, replace defective parts (WP 0075).
	Wheel is bent.	<ol style="list-style-type: none"> 1. If wheel is bent, remove tire and wheel and install spare in place (WP 0077 through WP 0081). 2. Remove tire from bent wheel and replace wheel (WP 0076).
	Improper tire size and type.	<p>NOTE</p> <p>Only tires listed in TM 9-2330-381-24P, Repair Parts and Special Tools List (RPSTL), are authorized for use.</p> <ol style="list-style-type: none"> 1. If tire is not 215/75 R17.5, remove tire. 2. Check spare for correct size and type. Install spare in place of improper tire (WP 0077 through WP 0081).
	Steering linkages are loose and have improper adjustments.	<ol style="list-style-type: none"> 1. Adjust and tighten steering linkages (WP 0038).
Tire wear is excessive or uneven.	Tire size and type are improper.	<p>NOTE</p> <p>Only tires listed in TM 9-2330-381-24P, Repair Parts and Special Tools List (RPSTL), are authorized for use.</p> <ol style="list-style-type: none"> 1. If tire is not 215/75 R17.5, remove tire. 2. Check spare for correct size and type. Install spare in place of improper tire (WP 0077 through WP 0081). 3. Check tire air pressure (WP 0035).
	Lug nuts are loose and missing. Lugs are missing and broken.	<ol style="list-style-type: none"> 1. If lug nuts are loose or missing, replace and tighten. Torque as required (WP 0075). 2. If lug studs are broken or stripped, replace defective parts (WP 0075).

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
In tow, semitrailer wanders or pulls to one side (on level ground).	Wheel is bent.	<ol style="list-style-type: none"> 1. If wheel is bent, remove tire and wheel and install spare in place (WP 0077 through WP 0081). 2. Remove tire from bent wheel and replace wheel (WP 0076).
	Steering linkages are loose and have improper adjustments.	<ol style="list-style-type: none"> 1. Adjust and tighten steering linkages (WP 0038).
	Tire air pressure is inadequate.	<p><u>WARNING</u></p> <div>  </div> <p>Always follow proper tire insulation procedures and warning. Failure to follow this warning may result in serious injury or death to personnel.</p> <ol style="list-style-type: none"> 1. Check tire air pressure (WP 0035). 2. If pressure is low, inflate tires to correct pressure of 95 psi (655 kPa).
	Wheel is loose.	<ol style="list-style-type: none"> 1. If lug nuts are loose, tighten and torque as required (WP 0035).
	Steering linkages are loose and need proper adjustment.	<ol style="list-style-type: none"> 1. Adjust and/or tighten steering linkages (WP 0038).
	After platform steering alignment is complete, semitrailer still wanders or pulls to one side (on level ground).	<ol style="list-style-type: none"> 1. Troubleshoot semitrailer for improper tracking.

END OF WORK PACKAGE

FIELD MAINTENANCE

BRAKE TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
2

References
WP 0013
WP 0037

WP 0068
WP 0072
WP 0073
WP 0074
WP 0075

INTRODUCTION

This work package covers brake troubleshooting.

Table 1. Brakes.

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
Brakes are weak or no brakes.	Tractor air pressure is low.	1. If tractor air pressure is low, notify field maintenance.
	Filter is clogged or dirty.	1. Check air cleaner for clogged or dirty filter.
	Gladhands are not properly connected.	2. Remove and replace air cleaner (WP 0072).
		1. Reconnect service to service and emergency to emergency (WP 0013).
		2. Ensure connections are tight (WP 0013). If symptom still exists, notify field maintenance.
	Air lines/connectors, brake chamber, and valves have leaks and defects.	1. If air lines/connectors are leaking, tighten, repair, or replace as required (WP 0073 and WP 0074).
		2. If a multifunction valve is leaking, replace multifunction valve (WP 0074).
		3. If a relay valve is leaking, replace relay valve (WP 0074).
		4. If an air brake chamber is defective or is leaking, remove and replace air brake chamber (WP 0074).
	Brakes are improperly adjusted.	1. Perform service brake adjustment (WP 0037).
	Grease is on brake linings.	1. Replace inner bearing oil seal and replace brake shoes as required (WP 0068).
	Brake linings are worn.	1. Replace brake shoes as required (WP 0068).
	Faulty relay valve operation.	1. If left and right bogie's (No. 1) air brake chambers DO NOT operate, replace relay valve No. 1 (WP 0074).
		2. If left and right bogie's (No. 2) air brake chambers DO NOT operate, replace relay valve No. 2 (WP 0074).

SYMPTOM	MALFUNCTION	CORRECTIVE ACTION
Brake has slow application or slow release.	Air pressure is low.	<ol style="list-style-type: none"> 3. If left and right bogie's (No. 3) air brake chambers DO NOT operate, replace relay valve No. 3 (WP 0074). 4. If left and right bogie's (No. 4) air brake chambers DO NOT operate, replace relay valve No. 4 (WP 0074). 5. If left and right bogie's (No. 5) air brake chambers DO NOT operate, replace relay valve No. 5 (WP 0074). 6. If a single air brake chamber does not operate properly, remove and replace defective chamber (WP 0074).
	Air line and hoses have restrictions. Air brake chamber does not operate properly.	<ol style="list-style-type: none"> 1. Check for low air pressure, leakage at connections, air line, or valves. 2. If air line/connections are leaking, repair or replace as needed (WP 0073 and WP 0074). 3. If a valve is leaking, remove and replace valve (WP 0074). 1. Clean or replace lines and hoses (WP 0073 and WP 0074). 1. If a single air brake chamber does not operate properly, remove and replace defective chamber (WP 0074). 2. If a set of air brake chambers does not operate properly, remove and replace a relay valve (WP 0074).
Brakes are grabbing.	Brake adjustment is uneven.	<ol style="list-style-type: none"> 1. If brakes are out of adjustment, adjust brakes (WP 0037).
	Grease is on brake linings. Brake linings are worn or loose. Brake drum is excessively scored, cracked, or out-of-round.	<ol style="list-style-type: none"> 1. Replace brake shoes (WP 0068). 2. Replace inner bearing oil seal (WP 0075). 1. If brake linings are worn or loose, replace brake shoes (WP 0068). 1. If brake drum is defective, or if above steps DO NOT correct malfunction, notify field maintenance.

END OF WORK PACKAGE

CHAPTER 4
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)
FOR
SEMITRAILER, TRANSPORTER, HEAVY EQUIPMENT 70 TON, M1000

FIELD MAINTENANCE

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) INTRODUCTION

GENERAL

The Preventive Maintenance Checks and Services (PMCS) (WP 0035) must be performed by the operator to ensure that the equipment is in good operating condition and ready for its primary mission.

To ensure maximum operational readiness, it is necessary that the Heavy Equipment Transporter (HET) semitrailer be inspected at regular intervals so that any defects can be discovered and corrected before any serious damage or failure occurs. Any maintenance problems that are beyond your authorization will be referred to Sustainment for correction.

Always perform the PMCS in the same order, so that it becomes a habit. Once you have had some practice, you will quickly spot anything that is wrong. Perform the PMCS as follows:

1. **BEFORE PMCS.** Just before you operate the HET. Pay attention to all WARNINGS, CAUTIONS, and NOTES.
2. **DURING PMCS.** While you operate the HET. During operation means to monitor the HET and its related components while it is actually being operated. Pay attention to all WARNINGS, CAUTIONS, and NOTES.
3. **AFTER PMCS.** Right after operating the HET.
4. **WEEKLY PMCS.** Once a week or if you are operating the semitrailer for the first time. Pay attention to all WARNINGS, CAUTIONS, and NOTES.
5. **MONTHLY.** Once a month.
6. **QUARTERLY.** Once every 3 months.
7. **SEMIANNUALLY.** Once every 6 months.

Always observe the WARNINGS, CAUTIONS, and NOTES before and during operation. A WARNING means someone could be injured or killed. A CAUTION means the equipment could be damaged. If the equipment fails to operate, perform the troubleshooting procedures found in WP 0030, WP 0031, WP 0031, and WP 0033. Report any deficiencies by using the proper forms. See DA PAM 738-750.

NOTE

- There is a 5-year service requirement for the Heavy Equipment Transporter (HET) M1000 semitrailer. This is a very labor-intensive service requirement and requires advance planning and budgeting. TACOM recommends that you begin advance planning and budgeting at least 24 months prior to the 5-year service due date.
- In addition, proper and timely performance of all services and lubrications will help reduce the maintenance burden and parts consumption associated with performing the 5-year service.

EXPLANATION OF COLUMN ENTRIES

The PMCS table in work package WP 0035 lists the inspections and care required to keep the Heavy Equipment Transporter (HET) M1000 semitrailer in good operating condition. It is set up so you can perform BEFORE operation checks as you walk around the HET. The PMCS table includes the following columns:

1. The **ITEM NO.** column indicates the number assigned to each PMCS procedure. The procedures are numbered in logical sequence of performance.
2. The **INTERVAL** column indicates when to perform a certain check or service.
3. The **MANHOUR** column indicates how long it should take to perform a check or service procedure.
4. The **PROCEDURE** column states how to do the required checks and services. Carefully follow these instructions. If you do not have tools or if the procedure tells you to, notify your supervisor.
5. The **EQUIPMENT NOT READY/AVAILABLE IF** column indicates when the HET is non-mission capable and why the equipment cannot be used. The terms ready/available and mission capable refer to the same status: equipment is on hand and is able to perform combat missions. (See AR 700-138.)

If the HET does not perform as required, refer to Chapter 3, Troubleshooting. If anything looks wrong and you cannot fix it, complete a DA Form 2404. IMMEDIATELY report the problem to your supervisor.

COMMON PMCS PRACTICES

1. Keep it clean: Dirt, grease, oil, and debris only get in the way and may cover up a serious problem. While doing your PMCS, clean as you work and as you go. Use dry cleaning solvent (WP 0170) on all metal surfaces. Use soap and water when you clean rubber and plastic material.
2. Bolts, nuts, and screws: Check them for obvious looseness and missing, bent, defective, or broken condition. Don't try them all with a tool, but you can look for chipped paint, bare metal, or rust around bolt heads. If you find one that you think is loose, tighten and report it to field maintenance.
3. Welds: Look for loose or chipped paint, rust, or gaps where parts are welded together. If you find a bad weld, report it to field maintenance.
4. Electrical wiring and connections: Look for cracked or broken insulation, bare wires, and loose or broken connections. Tighten loose connectors and ensure the wires are in good shape.
5. Hoses and fluid lines: While doing your PMCS, look and listen for wear, damage, and leaks in all hoses and fluid lines. Ensure clamps and fittings are tight. Wet spots mean leaks. A stain around a fitting or connector can mean a leak. Look for these signs. If a leak comes from a loose fitting or connector that can be easily fixed, tighten it using the two wrench method. If you can't fix it easily or if a hose or line appears broken or worn, report it to field maintenance.
6. Mounted accessories: Check that mounted accessories are secure and in place before you begin to operate your semitrailer.

NOTE

Keep all of the general checks in mind every time you do your PMCS. This will help you spot trouble before it starts. It will also help you and your unit's maintenance to keep your semitrailer operational. In time, spotting possible trouble will become automatic.

7. When you check for GOOD CONDITION: Look at the item to see if it is safe and serviceable.
8. When you check for CORRECT ASSEMBLY OR STOWAGE: Look at the item to see if it is there, installed correctly, and properly secured.
9. The PREVENTIVE MAINTENANCE table starts on page 0035-1. It is set up so that you can make your Before operation checks as you walk around the semitrailer.
10. When you do your PREVENTIVE MAINTENANCE, look for items that appear in the blocks, "Equipment is not ready." If any of these faults are noted, do not operate your semitrailer until the repairs are made.

FLUID LEAKAGE

It is necessary for you to know how fluid leakage affects the status of the HET. Following are types/classes of leakages you need to know in able to determine the status of the HET. Learn these leakage definitions and remember, when in doubt, notify your supervisor. Equipment operation is allowed with minor leakage (Class I or II). Consideration must be given to fluid capacity in the item/system being checked/inspected.

When in doubt, notify your supervisor. When operating with Class I or II leaks, continue to check fluid levels as required in the PMCS. Class III leaks should be reported immediately to your supervisor.

1. **Class I**

Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.

2. **Class II**

Leakage of fluid great enough to form drops, but not enough to cause drops to drip from item being checked/inspected.

3. **Class III**

Leakage of fluid great enough to form drops that fall from item being checked/inspected.

END OF WORK PACKAGE

FIELD MAINTENANCE

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

INITIAL SETUP:

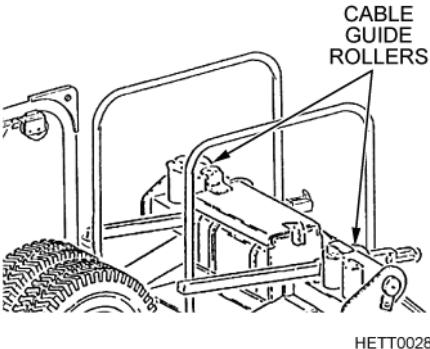
References

WP 0004

Equipment Condition

Heavy Equipment Transporter (HET)
set up (WP 0004)

Preventive Maintenance Checks and Services (PMCS) for HET

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
1	Before	Cable Guide	 <p>Figure 1. Cable Guide.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the cable guide rollers for freedom of movement and corrosion. 2. Check for presence of lubrication. 	For recovery of disabled vehicles: Rollers that are so severely gouged that they tear or shred the cable or will not turn.

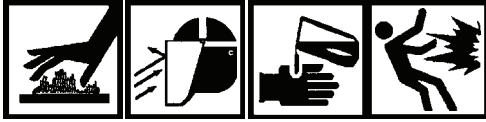
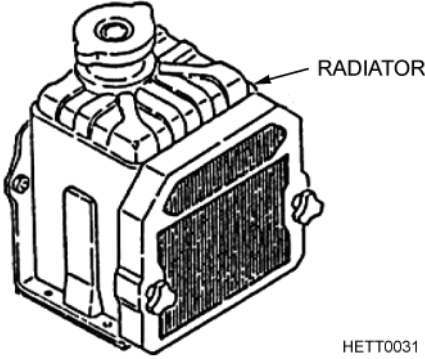
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
2	Before	Davit Assembly	<p style="text-align: center;"><u>WARNING</u></p> <div> </div> <p>On some semitrailers a solar battery charger is mounted to the top of the gooseneck directly in front of the spare tires. Persons working on top of the gooseneck must take EXTREME care not to step on the gooseneck or trip over the solar battery charger. Failure to follow this warning may result in serious injury or death to personnel or damage to equipment.</p> <div> <p style="text-align: right;">HETT0029</p> </div> <p style="text-align: center;">Figure 2. Davit Assembly.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the davit assembly for secure mounting. 2. Check the cable for damage and corrosion. 3. Ensure the hand winch operates properly. 4. Ensure the cable guide is secured by the hitch pin. 	

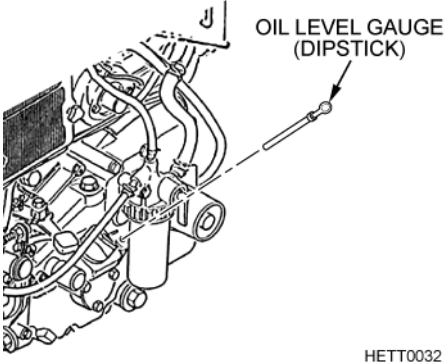
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
3	Before	Spare Wheel Assembly	<p style="text-align: center;"><u>WARNING</u></p> <div> </div> <p>On some semitrailers a solar battery charger is mounted to the top of the gooseneck directly in front of the spare tires. Persons working on top of the gooseneck must take EXTREME care not to step on the gooseneck or trip over the solar battery charger. Failure to follow this warning may result in serious injury or death to personnel or damage to equipment.</p> <div> </div> <p style="text-align: center;">Figure 3. Spare Wheel Assembly.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Ensure both spare wheel assemblies are present and securely mounted. <ol style="list-style-type: none"> a. Check the spare tires for tread wear, cuts, and weather deterioration. b. Inspect the valve stems. c. Check to see if tires are flat or under-inflated. 	Any tire is missing.

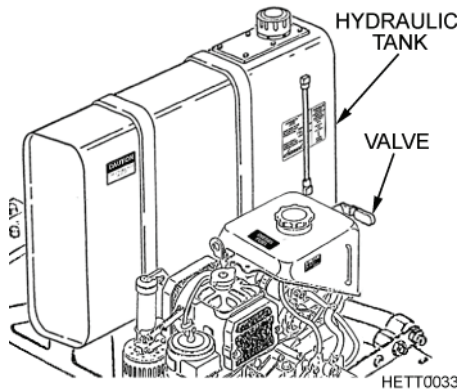
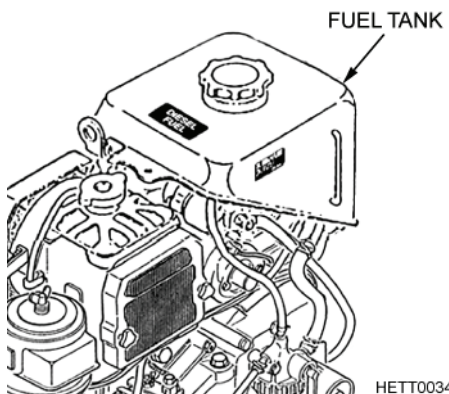
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
4	Before	APU Coolant Level	<p><u>WARNING</u></p>  <ul style="list-style-type: none"> • Use protective gloves when inspecting the APU or serious injury to personnel may result from engine heat. • When checking for leaks, never open any type of fluid holding tanks while the APU is hot or severe burns from the spraying of hot fluids may result. Give the systems time to cool before attempting to make any fluid checks. <p>Failure to follow these warnings may result in injury to personnel.</p> <p><u>NOTE</u></p> <ul style="list-style-type: none"> • If the gooseneck is lowered to the lowest position, the oil level in the APU will appear low on the dipstick. If the oil is visible on the dipstick, the APU may be started to adjust the gooseneck to normal running height. • Prior to checking the fluid levels on the semitrailer, both the gooseneck and the platform must be placed at normal running height for accurate readings.  <p>HETT0031</p> <p>Figure 4. Coolant Level.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Check the APU coolant level. 	Any Class III leaks exist.

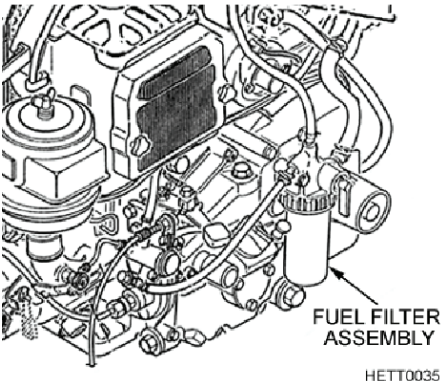
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
4	Continued	APU Coolant Level	a. If coolant level is low, fill the radiator with coolant as required. b. Check the cooling system for leaks. c. Check the APU coolant for contamination.	
5	Before	APU Oil Level	<div>  </div> <p>Figure 5. Oil Level.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Remove the oil level gauge (dipstick) and check the APU oil level. 2. Inspect the APU for oil leaks. 3. Add oil as required. <ol style="list-style-type: none"> a. Maintain the oil level between the ADD and FULL marks. b. DO NOT overfill. 	Any Class III leaks exist.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
6	Before	APU Hydraulic Tank	 <p>Figure 6. Hydraulic Tank.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the hydraulic tank for leaks and secure mounting. <ol style="list-style-type: none"> a. Check the hydraulic fluid level. 2. Ensure the valve is in the open position. 	Any Class III leaks exist.
7	Before	APU Fuel Tank	 <p>Figure 7. APU Fuel Tank.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Check the APU fuel tank for fuel. <ol style="list-style-type: none"> a. If fuel is not visible on sight gauge, remove the cap and screen and look inside the tank. b. If fuel is low or there is an insufficient amount for intended use, refill the tank as required. 	Any Class III leaks exist.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
8	Before	APU Fuel Filter Assembly	 <p>Figure 8. APU Fuel Filter Assembly.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Visually check the sediment bowl on the fuel filter assembly for contaminants and water. 2. If contaminants are found, notify sustainment maintenance. 	Any Class III leaks exist.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED


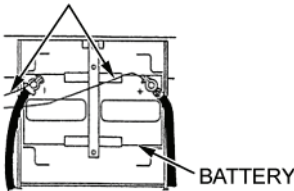
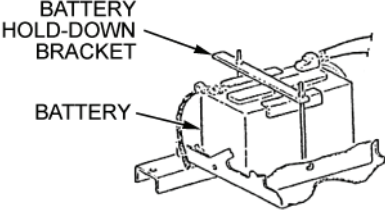
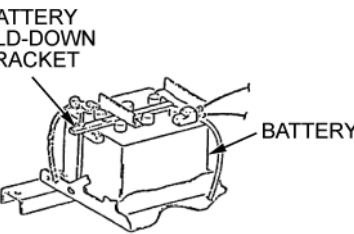
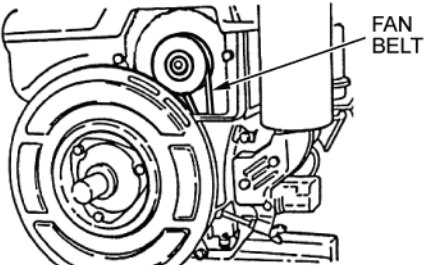
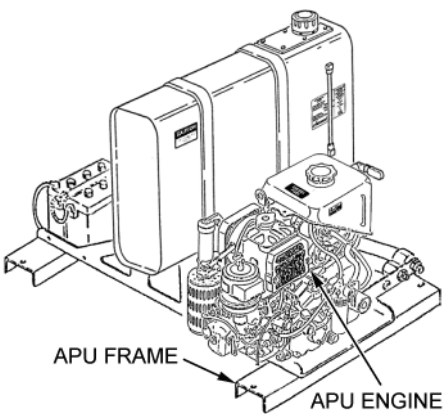
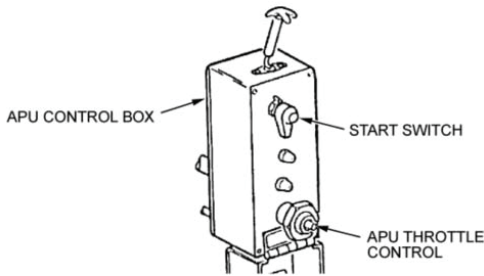
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
9	Before	APU Battery	<p style="text-align: center;"><u>WARNING</u></p>  <p>DO NOT wear watches, rings, or other jewelry that could short out the battery terminals while servicing the battery. DO NOT smoke or use open flame around batteries. The battery may explode from a spark. Battery acid is harmful to skin and eyes. Wear protective goggles to prevent injury to personnel when working with batteries. Failure to follow this warning may result in injury to personnel.</p> <p style="text-align: center;">SOLAR LEADS (SOME SEMITRAILERS)</p>  <p style="text-align: center;">BATTERY HOLD-DOWN BRACKET</p>  <p style="text-align: center;">BATTERY HOLD-DOWN BRACKET</p>  <p style="text-align: right;">HETT0036</p>	Battery is unserviceable, missing, or leaking; terminals are burnt; or hold-down brackets are not secure.

Figure 9. APU Battery.


PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
			Driver <ol style="list-style-type: none"> Ensure the battery is secured to the APU frame. <ol style="list-style-type: none"> Ensure the battery hold-down bracket is properly installed for the type of battery used. Visually inspect the battery for a cracked or leaking casing and broken, burned, or corroded terminals. If a solar battery charger is installed, ensure that the leads are firmly attached to the battery terminals. 	
10	Before	APU Fan Belt	 <p style="text-align: right;">HETT0224</p> <p style="text-align: center;">Figure 10. APU Fan Belt.</p> Driver <ol style="list-style-type: none"> Check for the presence of a fan belt. <ol style="list-style-type: none"> Inspect the fan dynamo for cracks, breaks, or missing hardware. 	<p>Fan belt is missing.</p> <p>Fan dynamo is cracked or missing hardware.</p>
11	Before	APU Engine	 <p style="text-align: right;">HETT0845</p> <p style="text-align: center;">Figure 11. APU Engine.</p> Driver <ol style="list-style-type: none"> Check the APU engine for proper mounting to the APU frame. 	

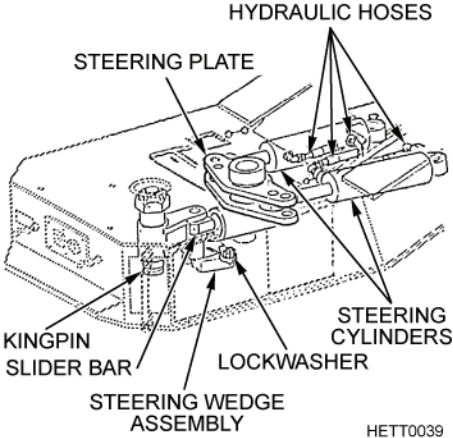
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
12	Before	APU Control Box	 <p>Figure 12. APU Control Box.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the APU control box for secure mounting and corrosion. <ol style="list-style-type: none"> a. Ensure the APU throttle control and START switch operate properly without binding or sticking. 2. Ensure the START switch returns to the OFF position when released from the GLOW or START position. 3. Ensure the throttle is pushed in and the START switch is in the OFF position. 4. Start the APU. 	<p>Controls fail to operate or APU does not start after four attempts.</p> <p>Oil pressure indicator light does not go off within 15 seconds of starting the APU.</p>

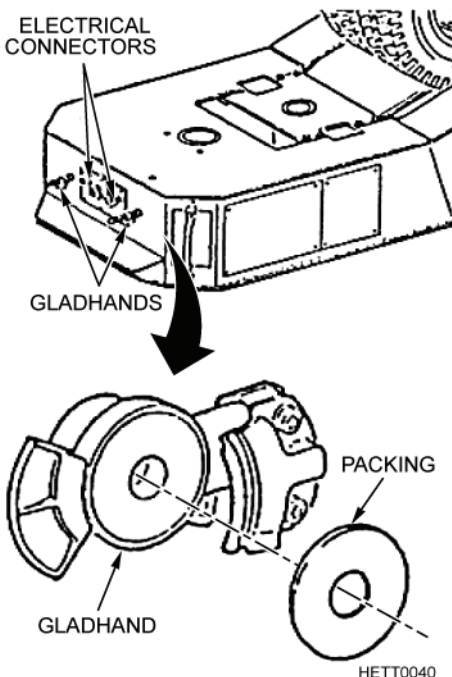
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
13	Before	Auxiliary Power Unit (APU)	<p style="text-align: center;"><u>WARNING</u></p> <div style="text-align: center;">  </div> <ul style="list-style-type: none"> • Use eye and ear protection and protective gloves when inspecting the APU while it is running or serious injury to personnel may result from moving parts, excessive noise level, and engine heat. • When checking for leaks, never open any type of fluid holding tanks during operation or while under pressure or severe burns from the spraying of hot fluids may result. <p>Failure to follow these warnings may result in injury to personnel.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Check for unusual noises, excessive or discolored exhaust smoke, or fluid leaks from the APU while the APU is running. <ol style="list-style-type: none"> a. Check the APU for coolant, fuel, oil, and hydraulic leaks. b. Ensure the APU responds to the throttle control. 2. Leave the APU running. 	<p>Any Class III leaks exist.</p> <p>Excessive noise or discolored exhaust.</p>

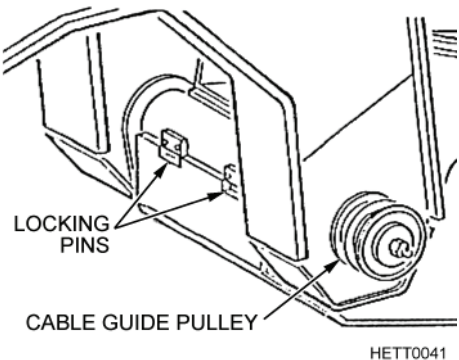
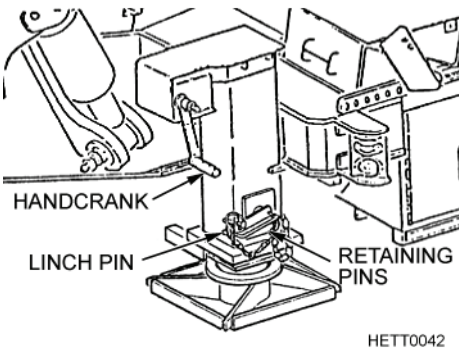
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
14	Before	Steering Console	<p>NOTE</p> <p>The hydraulic component/system inspection is a multiple point inspection that must be performed each time a hydraulic component/item is encountered.</p>  <p>HETT0039</p> <p>Figure 13. Steering Console.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the steering console for the condition of the kingpin, steering wedge assembly, steering plate, steering cylinders, hydraulic hoses, and slider bar. 2. Check for cracks, dents, leaks, and presence of lubrication. 3. If the semitrailer is coupled to the tractor, ensure that the steering wedge is snugly seated in the fifth wheel vee. 	<p>Any cracks exist.</p> <p>Any Class III leaks exist.</p>

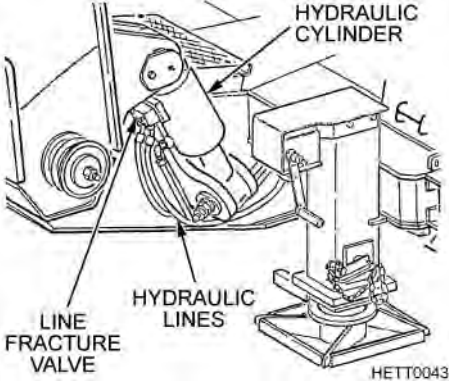
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
15	Before	Intervehicular	<p>NOTE</p> <ul style="list-style-type: none"> The electrical/air system component and system inspections on the semitrailer are multiple inspections that must be performed each time an electrical/air system component is encountered. It is possible to have what sounds like an air leak coming from air frame weldments that are not part of the air system and is not a deadline.  <p>The diagram illustrates the components of intervehicular connections. The top part shows a perspective view of a vehicle's rear end with labels for 'ELECTRICAL CONNECTORS' and 'GLADHANDS'. An arrow points from the 'GLADHANDS' label to a detailed exploded view of the coupling mechanism below. This detailed view shows a 'GLADHAND' (a large circular flange) being mated with a coupling that includes 'PACKING' (a circular ring) and a 'GLADHAND' (a smaller circular flange). The identifier 'HETT0040' is located at the bottom right of the diagram.</p> <p>Figure 14. Intervehicular Connections.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect two electrical connectors for secure mounting and damage. 2. Inspect the pins for any bent, burned, or broken conditions. Look for foreign matter buildup. 3. Inspect the gladhands for secure mounting and for damaged or missing packing. 4. Couple the tractor and semitrailer. 	<p>Connectors are loose or damaged making them inoperable.</p> <p>Gladhand or packing is missing, damaged, or leaking.</p> <p>Any air system leaks.</p> <p>Any damage is present.</p>

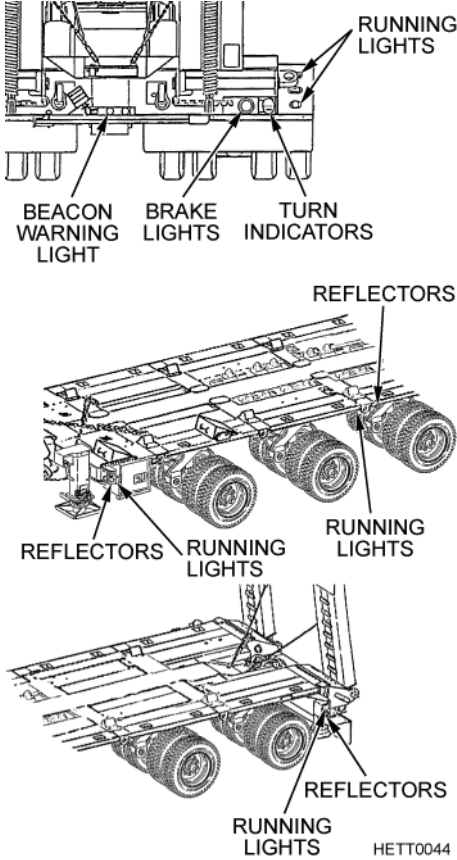
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
16	Before	Pivot Pin	 <p>Figure 15. Pivot Pin.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Ensure two locking pins and attaching hardware are in place and secure. 2. Check the cable guide pulley for wear, cracks, binding, and obvious damage. 	<p>Hardware is missing.</p> <p>For recovery of disabled vehicles: Pulley is cracked or so severely gouged that it tears/shreds cable or will not turn.</p>
17	Before	Front Support Legs	 <p>Figure 16. Front Support Legs.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the front support leg welds and attaching/mounting hardware. 2. Remove the linch pin and retaining pin. 3. Operate the handcrank to ensure proper operation without binding. 	Front support leg is inoperative.

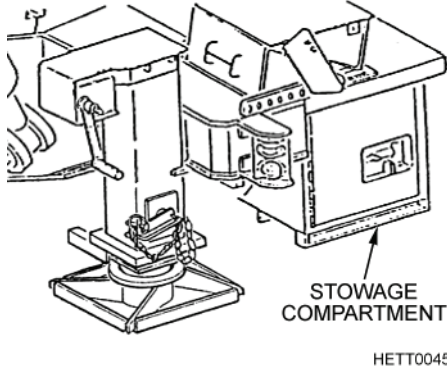
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
18	Before	Gooseneck Pivot Cylinder	 <p>Figure 17. Gooseneck Pivot Cylinder.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the gooseneck pivot cylinders for damage, missing hardware, and leaks on the hydraulic cylinder, line fracture valve, and hydraulic lines. 	<p>Any Class III leaks exist.</p> <p>Damage to cylinder occurs.</p>

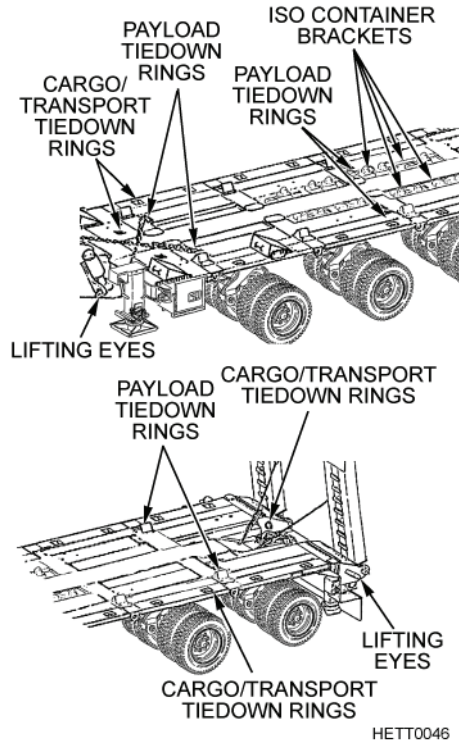
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
19	Before	Vehicle Lights	<p>NOTE</p> <ul style="list-style-type: none"> Some semitrailers may have light emitting diode (LED) lights installed. An assistant is needed while checking the brake lights.  <p>Figure 18. Vehicle Lights.</p> <p>Driver</p> <ol style="list-style-type: none"> Look for damage and the presence of lenses for the running lights, beacon warning light, turn indicators, and brake lights. <ol style="list-style-type: none"> Look for the presence of and damage to reflectors. Operate the running lights, beacon warning light, turn indicators, and brake lights. Ensure all lights are working properly, including the blackout and marker lights. 	<p>Taillights or brake lights are not working properly.</p> <p>Twentyfive percent or more of diodes do not light.</p>

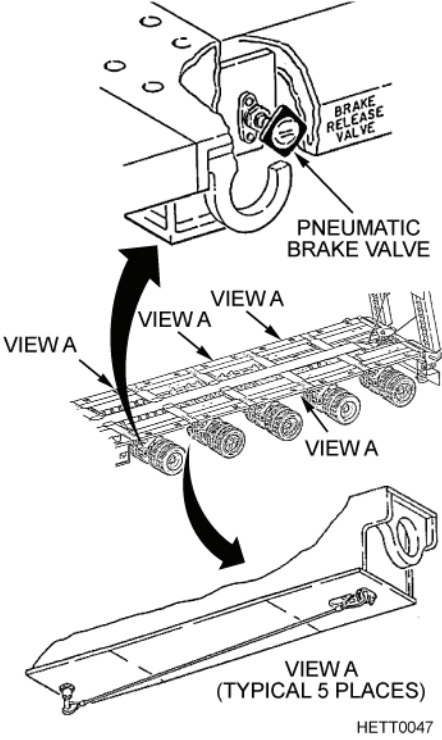
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
20	Before	Stowage Compartment and BII	 <p>Figure 19. Stowage Compartment.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the stowage compartment door hinges and latch for damaged or missing parts. <ol style="list-style-type: none"> a. Inventory the BII (WP 0169). b. Replace any BII that is damaged or missing. 	

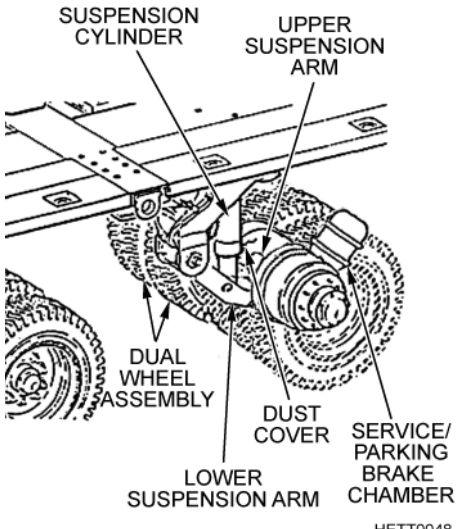
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
21	Before	Payload/Cargo Tiedown Rings And Lifting Eyes	 <p>Figure 20. Payload/Cargo Tiedown Rings and Lifting Eyes.</p> <p>Driver</p> <ol style="list-style-type: none"> Inspect 34 cargo/transport tiedown rings for damaged and missing hardware. <ol style="list-style-type: none"> Inspect four lifting eyes and six payload tiedown rings for damage and excessive corrosion. Inspect eight ISO container brackets for damaged and missing parts. 	<p>For missions requiring use of tiedown straps: Any cargo/transport tiedown rings are broken or missing.</p> <p>For missions requiring use of tiedown chains: Any payload tiedown rings are broken or missing.</p> <p>For missions requiring ISO container brackets: Any brackets are damaged or missing parts.</p>

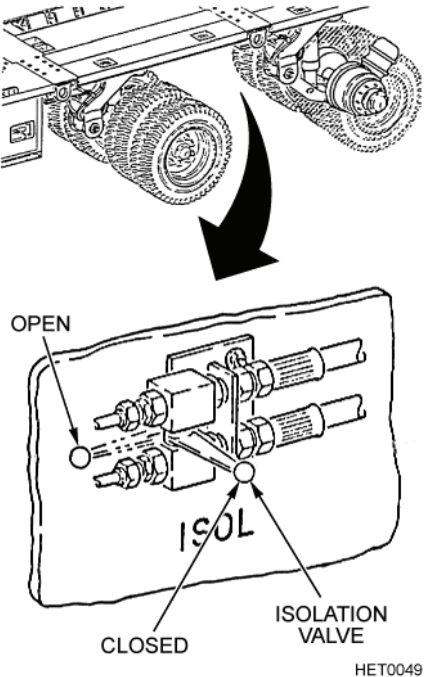
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
22	Before	Brake Release Valve/Drain Cocks	 <p>Figure 21. Brake Release Valve/Drain Cocks.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Check the pneumatic brake valve for leaks and damage. <ol style="list-style-type: none"> a. Check the pneumatic brake valve for loose or missing hardware. 2. Ensure that the emergency gladhand is not pressurized. 3. Push the valve handle in to release the brakes. The handle should stay in and release the brakes. <ol style="list-style-type: none"> a. Pull out the valve handle and ensure the brakes are engaged. 	

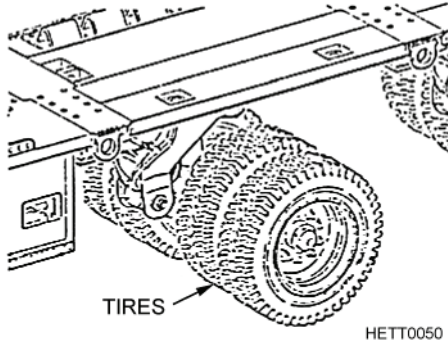
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
23	Before	Suspension System	<p style="text-align: center;"><u>CAUTION</u></p> <ul style="list-style-type: none"> • If mud or debris builds up in the lower suspension arm it must be cleared immediately or damage to the brake air lines will result. • If the brake dust cover or brake chamber dust plugs are distorted or missing, the brake chamber hole should be covered with tape or some other temporary means of protection until dust plug can be replaced or damage to equipment may result. <p style="text-align: center;"><u>NOTE</u></p> <p>The suspension system consists of ten assemblies that require multiple-point inspections each time a component/item is encountered.</p>  <p style="text-align: right;">HETT0048</p> <p style="text-align: center;">Figure 22. Suspension System.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the upper and lower suspension arms, axle, dual wheel assemblies, suspension cylinder, dust covers, slack adjusters, and service/parking brake chamber for leaks, damage, missing parts, and buildup of mud or debris. 	<p>Any damage exists.</p> <p>Any Class III leaks exist.</p>

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
24	Before	Suspension Isolation Valves and Fittings	 <p>Figure 23. Suspension System.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the suspension isolation valves and all line fittings in the area for leaks, obvious damage, and missing hardware. <ol style="list-style-type: none"> a. Ensure the handle of the valve is open (pushed in toward the center of the semitrailer). 	<p>Any damage exists.</p> <p>Any Class III leaks exist.</p>

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

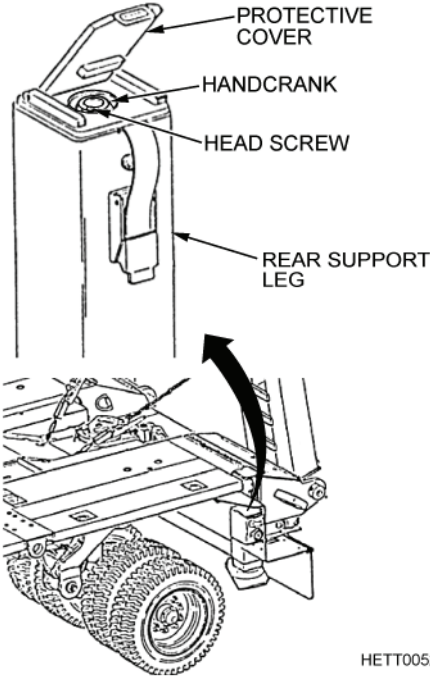
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
25	Before	Tire and Wheel	 <p>Figure 24. Tire and Wheel.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect each tire for cuts, cracks, bulges, blisters, ripples, foreign objects, unusual tread wear, or other defects (i.e., exposed cords or protruding filaments). <ol style="list-style-type: none"> a. Ensure that all lug nuts are present and tight. b. Inspect the valve stems for leaks and cuts. c. Inspect the valve stems for the presence of a valve cap. d. Inspect each wheel for obvious damage. e. Strike the tires with a blunt object to identify flat or under-inflated tires. 	<p>Three or more nuts are missing from any wheel.</p> <p>One or more flat tires that will not hold air.</p>

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

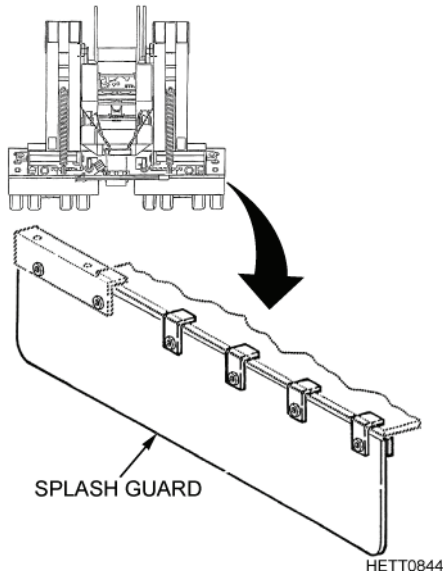
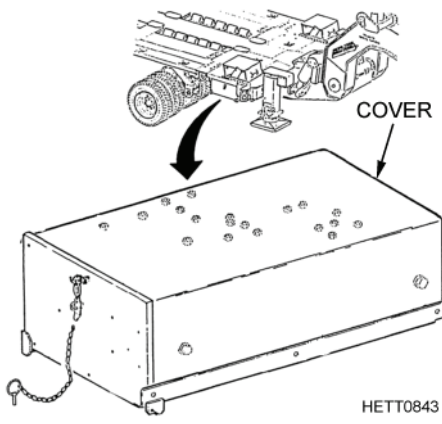
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
26	Before	Steering	<p style="text-align: center;">WARNING</p> <div> </div> <p>Prior to inspection, if the platform was raised, no one shall go under the semitrailer unless all support legs have been lowered and are supporting the platform. Failure to follow this warning may result in serious injury or death to personnel.</p> <p style="text-align: center;">NOTE</p> <p>The steering installation consists of four steering plates and interconnecting linkages that require multiple-point inspections each time a component/item is encountered.</p> <div> </div> <p style="text-align: right;">HETT0051</p>	<p>Any links that are broken or not attached.</p> <p>Any Class III leaks exist.</p>

Figure 25. Steering Installation.

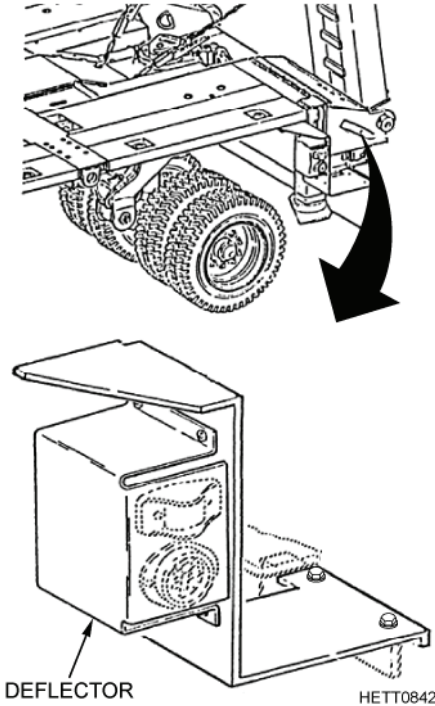
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
			Driver <ol style="list-style-type: none"> 1. Check four steering plates, all longitudinal struts, all connecting links, and two fixed linkages for breaks and secure mounting. <ol style="list-style-type: none"> a. Check the steering cylinders and hydraulic lines for leaks, defects, and secure mounting. 	
27	Before	Rear Support Legs	 <p style="text-align: right;">HETT0052</p> <p style="text-align: center;">Figure 26. Rear Support Legs.</p> Driver <ol style="list-style-type: none"> 1. Inspect the rear support legs, welds, and attaching/mounting hardware. 2. Operate the handcrank on each support leg to ensure proper operation without binding. 3. Ensure that protective covers are in place. 4. Check that rear support legs are fully retracted and the cover closes freely and latches properly. 5. Ensure the socket head screw is positioned outboard. 	<p>Rear support legs are inoperative or missing.</p> <p>Legs cannot be retracted or tightened.</p>

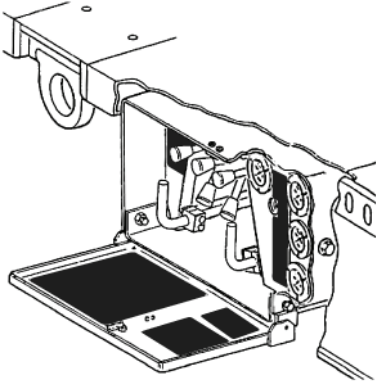
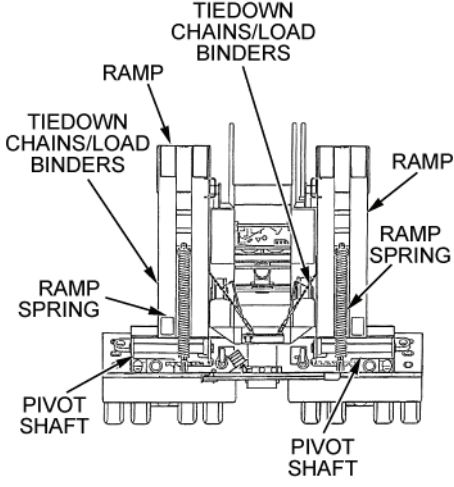
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
28	Before	Splash Guards	 <p>Figure 27. Splash Guards.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Check for deteriorating or missing parts. 	
29	Before	Covers	 <p>Figure 28. Splash Guards.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the covers for cracks, breaks, and missing parts. 	

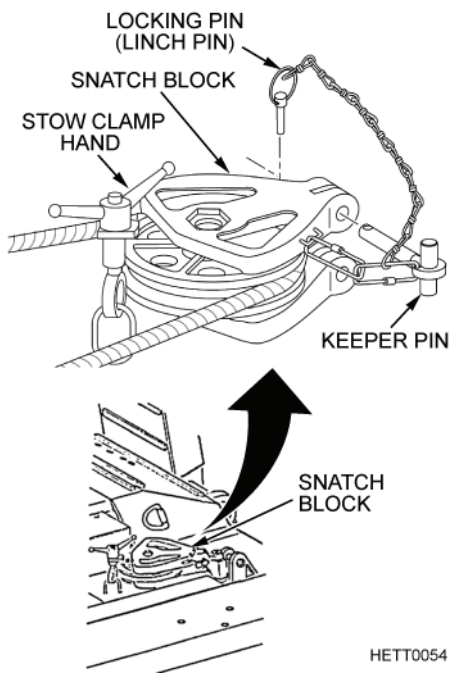
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
30	Before	Defectors	 <p>The diagram consists of two parts. The top part is a perspective view of a vehicle chassis showing the rear axle and wheels. A large black arrow points from the chassis towards a detailed view of a deflector unit below. The deflector unit is a rectangular box with a hinged lid that is open, revealing internal components including a fan and wiring. An arrow points to the front of the unit with the label 'DEFLECTOR'. The part number 'HETT0842' is printed at the bottom right of the unit's base.</p> <p>Figure 29. Deflectors.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the deflectors for cracks, breaks, and missing parts. 	

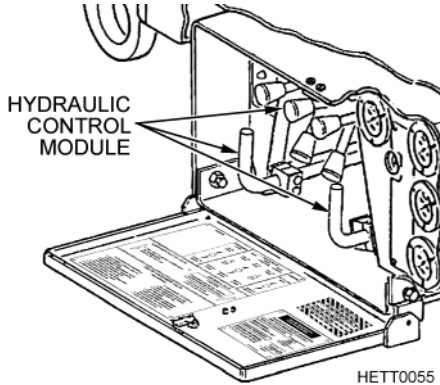
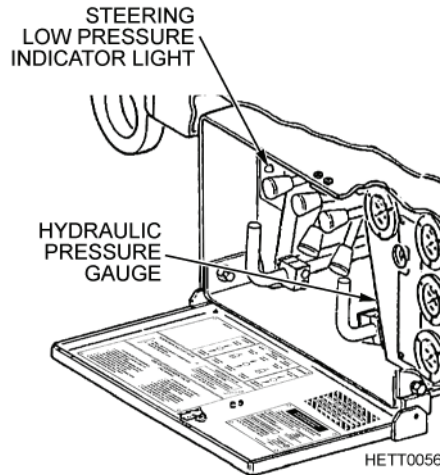
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
31	Before	Data Plates, Decals, and Stencils	 <p>DATA PLATES, DECALS, AND STENCILS HETT0846</p> <p>Figure 30. Data Plates.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the data plates, decals, and stencils to ensure that they are visible and legible. <ol style="list-style-type: none"> a. Ensure that rivets are not missing. b. Inspect the decals to ensure that there are no rips or tears. 	
32	Before	Loading Ramps	 <p>HETT0053</p> <p>Figure 31. Loading Ramps.</p>	<p>Ramp(s) cannot be lowered or raised properly.</p> <p>Ramp is missing or severely damaged.</p>

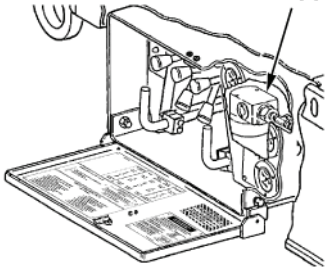
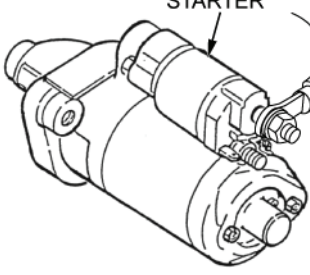
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
			Driver <ol style="list-style-type: none"> Inspect the ramps, tiedown chains/load binders, ramp spring, guide rod assembly, and pivot shafts for obvious damage. <ol style="list-style-type: none"> Lower and raise both ramps. Ensure that loading ramps are raised and the tiedown chains/load binders are secured with no sags in the chains. 	
33	Before	Snatch Block	 <p>Figure 32. Snatch Block.</p> Driver <ol style="list-style-type: none"> Inspect the snatch block for obvious damage and secure mounting. <ol style="list-style-type: none"> Ensure the locking pin (linch pin) assembly is properly installed to secure the keeper pin. Check that the snatch block is in proper stow position and is held firmly secured by the stow clamp handle. 	For missions requiring dual winch unloading: Snatch block is cracked or gouged so severely that it tears or shreds the cable, cannot be moved, or will not operate.

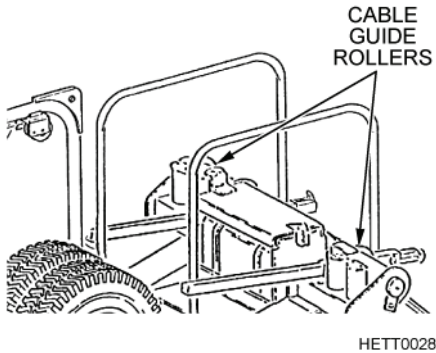
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
34	Before	Hydraulic Control Module	 <p>Figure 33. Hydraulic Control Module.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the hydraulic control module for leaks, obvious defects, and secure mounting. 2. Ensure that the control valve handles can operate freely without binding or sticking. 3. Operate the hydraulics in accordance with WP 0004. 4. Check for leaks, erratic operation of hydraulic components, and unusual noises during operation. 	<p>Any Class III leaks exist.</p> <p>Difficult operation of any handles exist.</p> <p>Erratic operation of hydraulic components exist.</p>
35	Before	Hydraulic Pressure Gauges	 <p>Figure 34. Hydraulic Pressure Gauges.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the hydraulic pressure gauges for leaks, obvious defects, and secure mounting. 	<p>Any Class III leaks exist.</p> <p>Obvious discoloration of the gauge fluid or bulging of the gauge face occurs.</p>

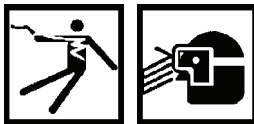
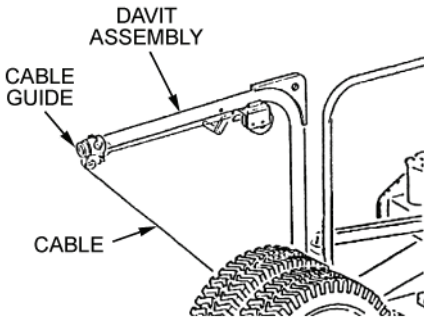
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
			<ol style="list-style-type: none"> 2. Turn the clearance marker lights on and check the steering low pressure indicator light. <ol style="list-style-type: none"> a. If the steering low pressure indicator light is lit, recharge the steering system. 3. If the semitrailer is coupled to the tractor, ensure the gooseneck isolation valve is in the RUN position and the suspension shutoff valve is in the SHUTOFF position (handle pushed inward). 	
36	Before	Hydraulic Pressure Filter Assembly	<p style="text-align: center;">HYDRAULIC PRESSURE FILTER ASSEMBLY</p>  <p style="text-align: right;">HETT0841</p> <p style="text-align: center;">Figure 35. Hydraulic Pressure Filter Assembly.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the area around the hydraulic pressure filter assembly for leaks. 	Any Class III leaks exist.
37	Before	Starter	<p style="text-align: center;">STARTER</p>  <p style="text-align: right;">HETT0840</p> <p style="text-align: center;">Figure 36. Starter.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect cables for corrosion. <ol style="list-style-type: none"> a. Inspect the cables for frayed or broken wires. 	


PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
38	Before	Auxiliary Power Unit Jump Start System	Driver <ol style="list-style-type: none"> 1. Inspect cables for corrosion. <ol style="list-style-type: none"> a. Inspect the cables for frayed or broken wires. b. Inspect the cables for defective terminal lugs or battery clamps. 	
39	During	Cable Guide	 <p>Figure 37. Cable Guide.</p> Driver <ol style="list-style-type: none"> 1. Inspect the cable guide rollers for freedom of movement and corrosion. 2. Check for presence of lubrication. 	For recovery of disabled vehicles: Any rollers are so severely gouged that they tear or shred the cable or will not turn.

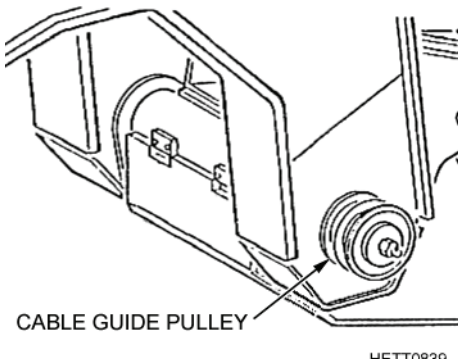
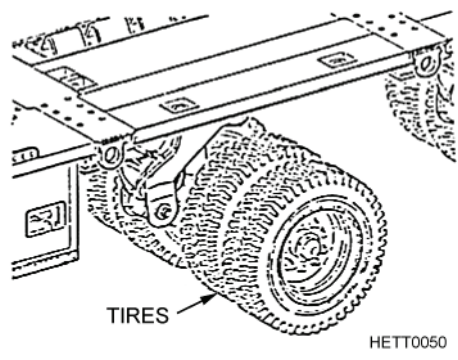
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
40	During	Davit Assembly	<p><u>WARNING</u></p>  <p>On some semitrailers a solar battery charger is mounted to the top of the gooseneck directly in front of the spare tires. Persons working on top of the gooseneck must take EXTREME care not to step on the gooseneck or trip over the solar battery charger. Failure to follow this warning may result in serious injury or death to personnel or damage to equipment.</p>  <p style="text-align: right;">HETT0029</p> <p>Figure 38. Davit Assembly.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the davit assembly for secure mounting. 2. Check the cable for damage and corrosion. 3. Ensure the hand winch operates properly. 4. Ensure the cable guide is secured by the hitch pin. 	

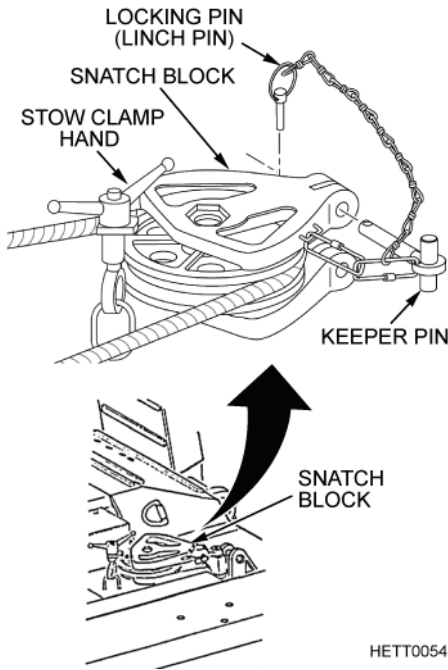
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
41	During	Auxiliary Power Unit (APU)	<p style="text-align: center;"><u>WARNING</u></p> <div style="text-align: center;">  </div> <ul style="list-style-type: none"> • Use eye and ear protection and protective gloves when inspecting the APU while it is running or serious injury to personnel may result from moving parts, excessive noise level, and engine heat. • When checking for leaks, never open any type of fluid holding tanks during operation or while under pressure or severe burns from the spraying of hot fluids may result. <p>Failure to follow these warnings may result in injury to personnel.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Check for unusual noises, excessive or discolored exhaust smoke, or fluid leaks from the APU while the APU is running. 2. Check the APU for coolant, fuel, oil, and hydraulic leaks. 3. Ensure the APU responds to the throttle control. 4. Leave the APU running. 	<p>Any Class III leaks exist.</p> <p>Excessive noise or discolored exhaust.</p>
42	During	Intervehicular Connections	<p style="text-align: center;"><u>NOTE</u></p> <ul style="list-style-type: none"> • The electrical/air system component and system inspections on the semitrailer are multiple inspections that must be performed each time an electrical/air system component is encountered. • It is possible to have what sounds like an air leak coming from air frame weldments that are not part of the air system and is not a dead line. <p>Driver</p> <ol style="list-style-type: none"> 1. Couple the tractor and semitrailer. 2. Listen for air leaks. 	Any air system leak.

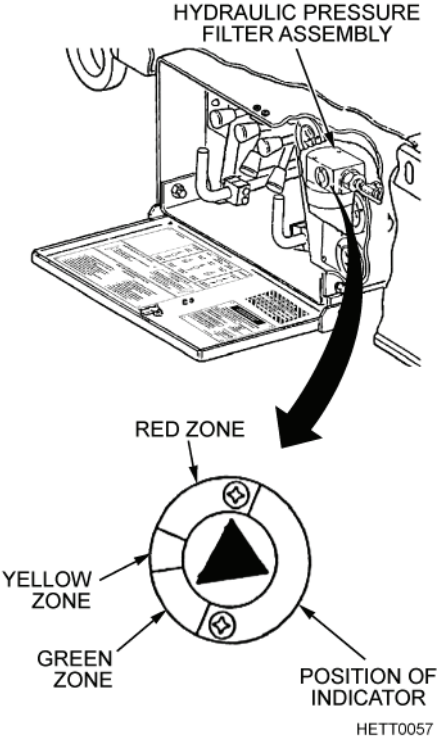
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
43	During	Pivot Pin	 <p>Figure 39. Pivot Pin.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Check the cable guide pulley for wear, cracks, binding, and obvious damage. 	<p>Pulley is cracked.</p> <p>Pulley is so severely gouged that it tears or shreds cable or will not turn.</p>
44	During	Suspension System	<p>Driver</p> <ol style="list-style-type: none"> 1. Check the suspension assembly for a failure that would make a suspension assembly non-operational. <ol style="list-style-type: none"> a. Refer to WP 0024 and isolate the affected suspension assembly. 	More than one suspension assembly is non-operational.
45	During	Tire and Wheel	 <p>Figure 40. Tire/Wheel Assembly.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Check to see if semitrailer has multiple tire and wheel failures and that existing spare tires are not enough to repair all failures. One suspension assembly may be isolated and tires on isolated suspension assembly used as required. 	More than six tires/wheels fail.

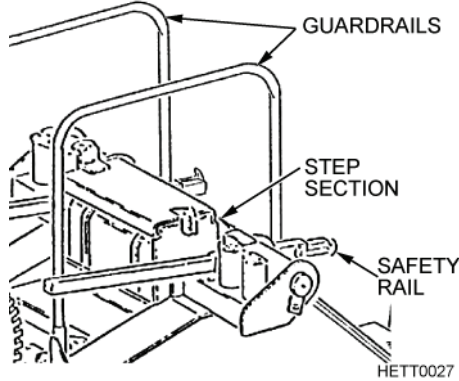
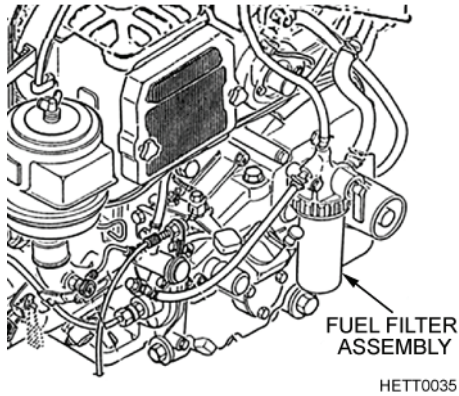
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
			<ol style="list-style-type: none"> Remove and replace the tires until all defective tires/wheels are stowed on the spare wheel carrier and the isolated suspension assembly. Remove and replace the tires and wheels (WP 0077 through WP 0081) and isolate the affected suspension assembly (WP 0024). 	
46	During	Snatch Block	 <p>Figure 41. Snatch Block.</p> <p>Driver</p> <ol style="list-style-type: none"> Inspect the snatch block for obvious damage and secure mounting. <ol style="list-style-type: none"> Ensure the locking pin (linch pin) assembly is properly installed to the secure keeper pin. Check that the snatch block is in proper stow position and is held firmly secured by stow clamp handle. 	For missions requiring dual winch unloading: Snatch block is cracked or gouged so severely that it tears or shreds the cable, cannot be moved, or will not operate.

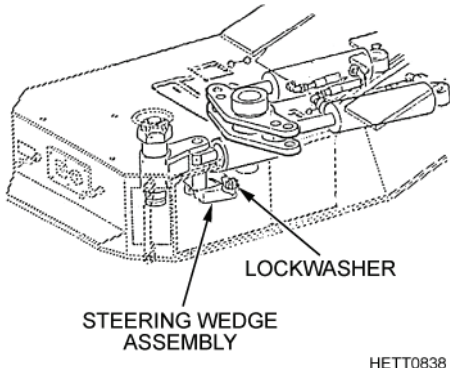
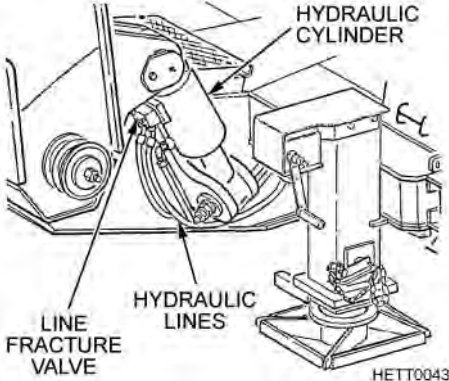
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
47	During	Hydraulic Pressure Filter Assembly	 <p>The diagram shows a hydraulic pressure filter assembly with a circular indicator. The indicator is divided into three zones: a top 'RED ZONE', a bottom-left 'YELLOW ZONE', and a bottom-right 'GREEN ZONE'. A black triangle, labeled 'POSITION OF INDICATOR', is shown pointing into the green zone. A curved arrow points from the indicator on the filter assembly to the circular diagram below it. The text 'HETT0057' is at the bottom right of the diagram.</p> <p>Figure 42. Hydraulic Pressure Filter Assembly.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Check the position of the indicator. The indicator should show a reading in the green zone. <ol style="list-style-type: none"> a. If the indicator is reading in the yellow zone, the element should be replaced as soon as possible. 	Indicator is in the red zone after oil has warmed to normal temperature.

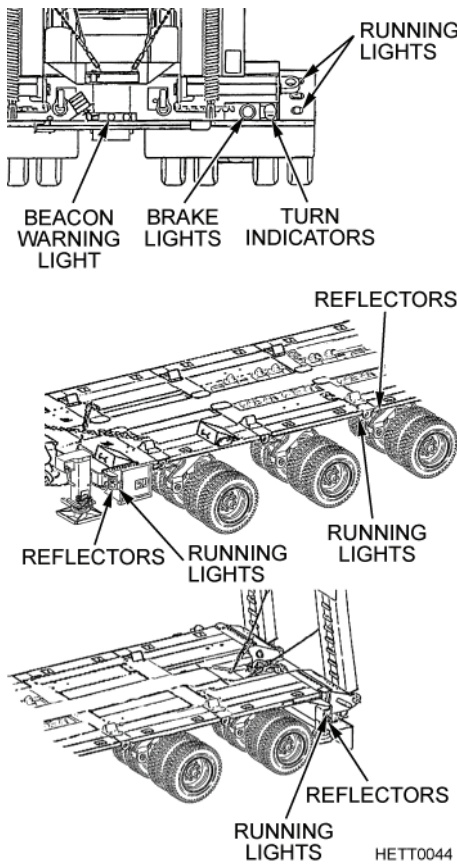
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
48	After	Steps and Guardrail	 <p>Figure 43. Steps and Guardrail.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the step sections, guardrails, and safety rail for secure mounting and missing hardware. 	
49	After	Auxiliary Power Unit (APU) Fuel Filter Assembly	 <p>Figure 44. APU Filter Assembly.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Visually check the sediment bowl on the fuel filter assembly for contaminants and water. <ol style="list-style-type: none"> a. If contaminants are found, notify sustainment maintenance. 	Any Class III leaks exist.

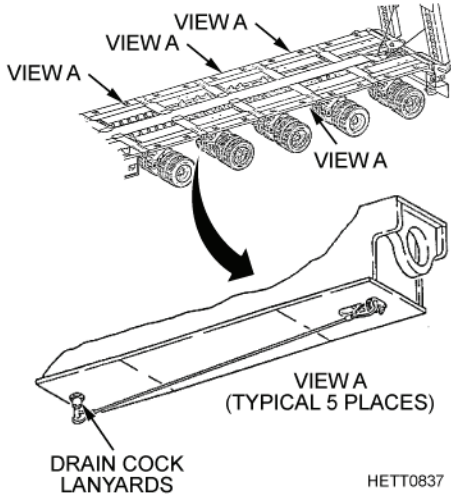
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
50	After	Steering Wedge Lockwasher	 <p>Figure 45. Steering Wedge.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Uncouple semitrailer from tractor (WP 0013). 2. Check the condition of the steering wedge lockwasher. <ol style="list-style-type: none"> a. Replace the lockwasher if it is flat, cracked, or missing. 	
51	After	Gooseneck Pivot Cylinders	 <p>Figure 46. Gooseneck Pivot Cylinder.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the gooseneck pivot cylinders for damage, missing hardware, and leaks on hydraulic cylinder, line fracture valve, and hydraulic lines. 	<p>Any Class III leaks exist.</p> <p>Any damage to cylinders has occurred.</p>

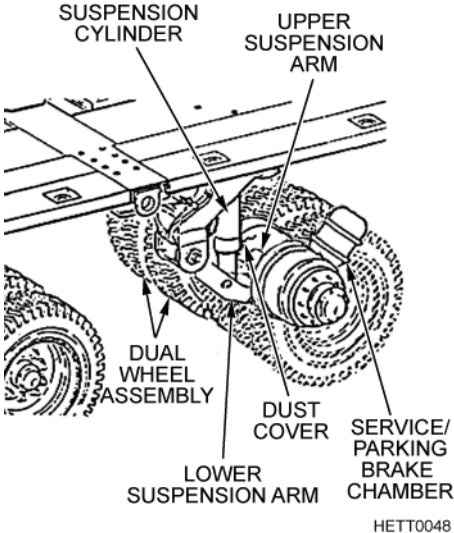
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
52	After	Vehicle Lights	 <p>Figure 47. Vehicle Lights.</p> <p>Driver</p> <ol style="list-style-type: none"> Look for presence of and damage to lenses for running lights, beacon warning light, turn indicators, and brake lights. <ol style="list-style-type: none"> Look for presence of and damage to reflectors. 	

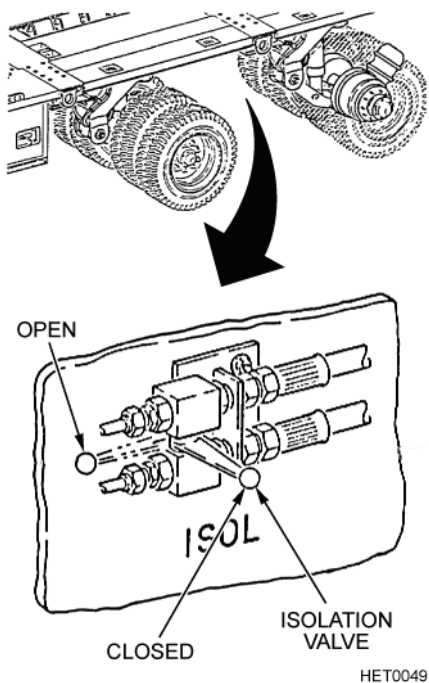
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
53	After	Air Tank Drain Cock Lanyards	<div><p>Figure 48. Lanyards.</p><p>Driver</p><ol style="list-style-type: none">1. Pull and hold each of the five air tank drain cock lanyards until moisture is no longer being discharged or until all air is released.</div>	

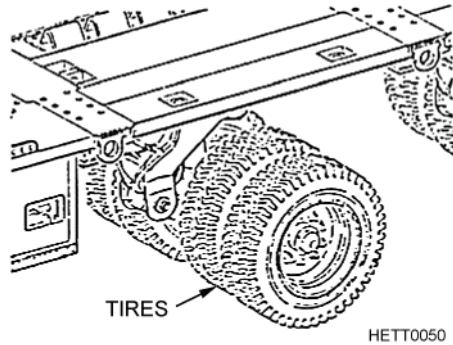
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
54	After	Suspension System	<p style="text-align: center;"><u>CAUTION</u></p> <ul style="list-style-type: none"> • If mud or debris builds up in the lower suspension arm it must be cleared immediately or damage to the brake air lines will result. • If the brake dust cover or brake chamber dust plugs are distorted or missing, the brake chamber hole should be covered with tape or some other temporary means of protection until dust plug can be replaced or damage to equipment may result. <p style="text-align: center;"><u>NOTE</u></p> <p>The suspension system consists of ten assemblies that require multiple-point inspections each time a component/item is encountered.</p>  <p style="text-align: right;">HETT0048</p> <p style="text-align: center;">Figure 49. Suspension System.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the upper and lower suspension arms, axle, dual wheel assemblies, suspension cylinder, dust covers, slack adjusters, and service/parking brake chamber for leaks, damage, missing parts, and buildup of mud or debris. 	<p>Any damage exists.</p> <p>Any Class III leaks exist.</p>


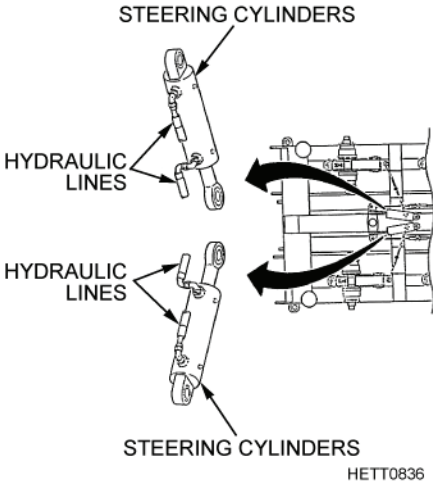
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
55	After	Suspension Isolation Valves and Fittings	 <p>Figure 50. Suspension System.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the suspension isolation valves and all line fittings in the area for leaks, obvious damage, and missing hardware. <ol style="list-style-type: none"> a. Ensure the handle of the valve is open (pushed in toward the center of the semitrailer). 	<p>Any damage exists.</p> <p>Any Class III leaks exist.</p>

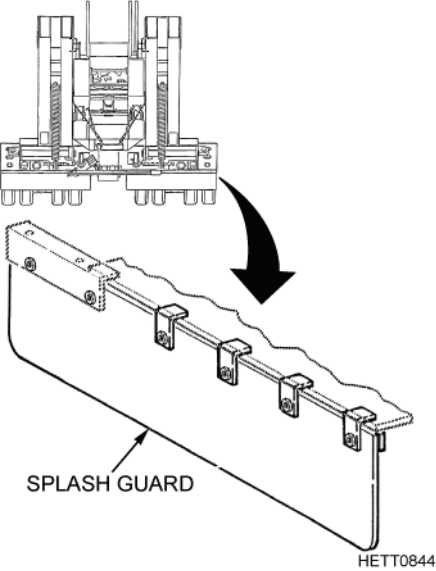
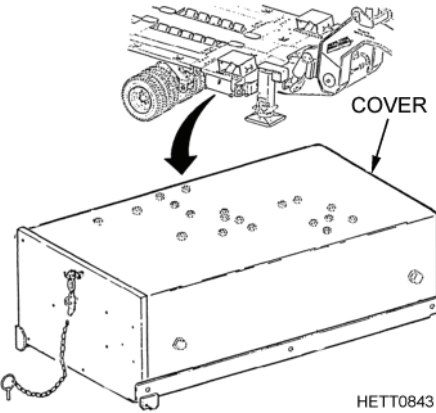
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
56	After	Tire and Wheel	 <p>Figure 51. Tire and Wheel.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect each tire for cuts, cracks, bulges, blisters, ripples, foreign objects, unusual tread wear, or other defects (i.e., exposed cords or protruding filaments). <ol style="list-style-type: none"> a. Ensure that all lug nuts are present and tight. b. Inspect the valve stems for leaks and cuts. c. Inspect the valve stems for the presence of a valve cap. d. Inspect each wheel for obvious damage. e. Strike the tires with a blunt object to identify flat or under-inflated tires. 	<p>Three or more nuts are missing from any wheel.</p> <p>One or more flat tires that will not hold air.</p>

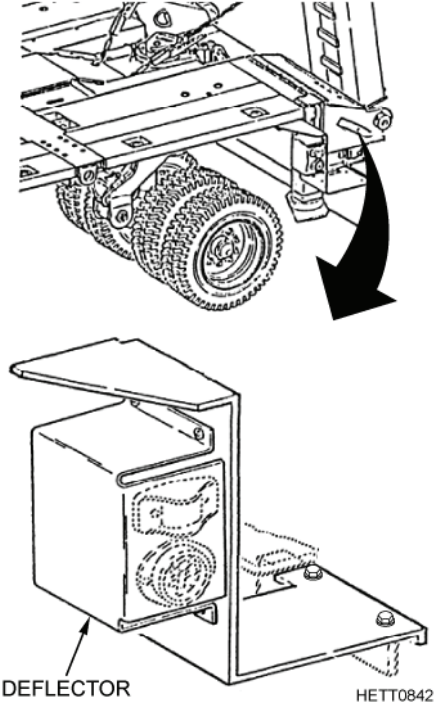
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
57	After	Steering	<p><u>WARNING</u></p>  <p>Prior to inspection, if the platform was raised, no one shall go under the semitrailer unless all support legs have been lowered and are supporting the platform. Failure to follow this warning may result in serious injury or death to personnel.</p> <p><u>NOTE</u></p> <p>The steering installation consists of four steering plates and interconnecting linkages that require multiple-point inspections each time a component/item is encountered.</p>  <p>Figure 52. Steering.</p> <p>Driver</p> <ol style="list-style-type: none">1. Check the steering cylinders and hydraulic lines for leaks, defects, and secure mountings.	Any Class III leaks exist.

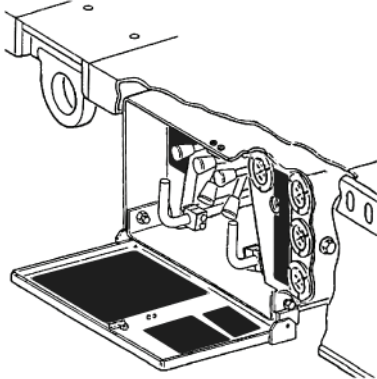
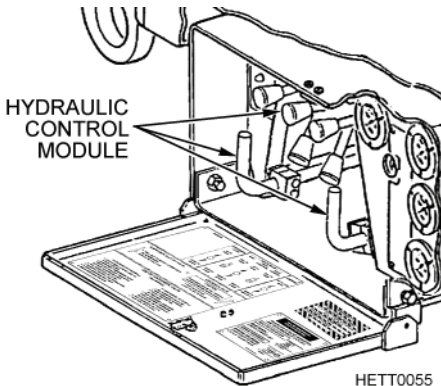
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
58	After	Splash Guards	 <p>Figure 53. Splash Guards.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Check for deteriorating or missing parts. 	
59	After	Covers	 <p>Figure 54. Covers.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the covers for cracks, breaks and missing parts. 	

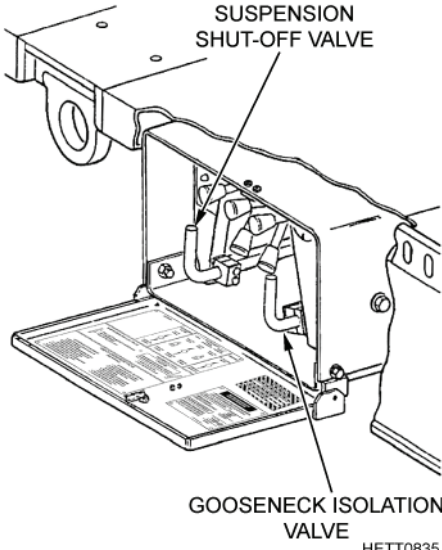
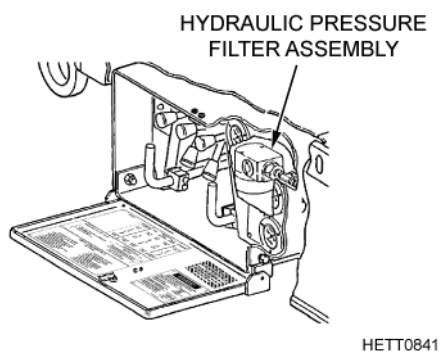
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
60	After	Deflectors	 <p>Figure 55. Deflectors.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the deflectors for cracks, breaks and missing parts. 	

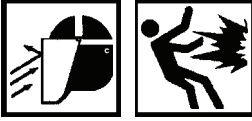
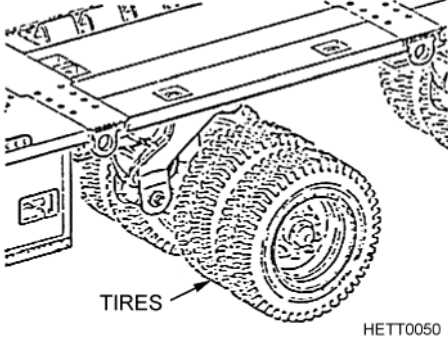
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
61	After	Data Plates, Decals, and Stencils	 <p>DATA PLATES, DECALS, AND STENCILS HETT0846</p> <p>Figure 56. Data Plates, Decals, and Stencils.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the data plates and stencils to ensure that they are visible and legible. <ol style="list-style-type: none"> a. Ensure that rivets are not missing. b. Inspect the decals to ensure that there are no rips or tears. 	
62	After	Hydraulic Control Module	 <p>HYDRAULIC CONTROL MODULE HETT0055</p> <p>Figure 57. Hydraulic Control Module.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the hydraulic control module for leaks, obvious defects, and secure mounting. 2. Ensure the control valve handles operate freely without binding or sticking. 	<p>Any Class III leaks exist.</p> <p>Difficulty in operating any handles.</p>

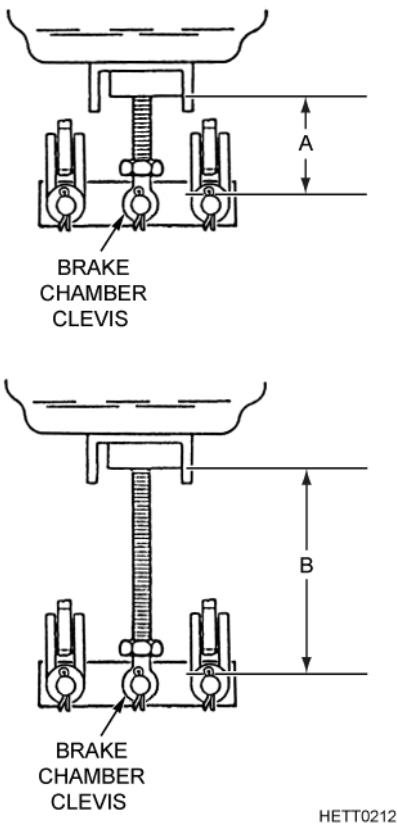
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
63	After	Hydraulic Isolation Valves	 <p>Figure 58. Hydraulic Isolation Valves.</p> <p>Driver</p> <ol style="list-style-type: none"> If the semitrailer is coupled to the tractor, ensure that the gooseneck isolation valve is in the RUN position and the suspension shutoff valve is in the SHUTOFF position (handle pushed inward). 	
64	After	Hydraulic Pressure Filter Assembly	 <p>Figure 59. Hydraulic Pressure Filter Assembly.</p> <p>Driver</p> <ol style="list-style-type: none"> Inspect the area around the hydraulic pressure filter assembly for leaks. 	Any Class III leaks exist.

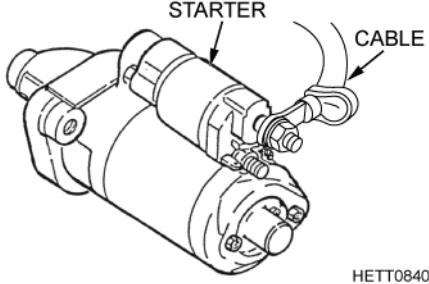
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
65	Weekly	Tires	<p><u>WARNING</u></p>  <p>Always use a snap-on chuck, an extension air hose (10 ft [3.1m] minimum), and an in-line pneumatic tire inflator gauge, and stay out of the sidewall trajectory area when inflating tires that are mounted on the M1000 semitrailer. Failure to follow this warning may result in serious injury or death to personnel.</p> <p><u>NOTE</u></p> <p>Always check the air pressure before moving the M1000 semitrailer and when the tires are cold. During use, tires generate heat, which increases pressure and will provide an inaccurate reading.</p>  <p>Figure 60. Tires.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Check the tire pressure (including spares) with a tire gauge. 2. Inflate the tires to the proper pressure of 95 psi \pm 5 psi (655 kPa \pm 34 kPa). Adjust the tire pressure using the inflator gauge with a 10 ft. extension air hose. 	


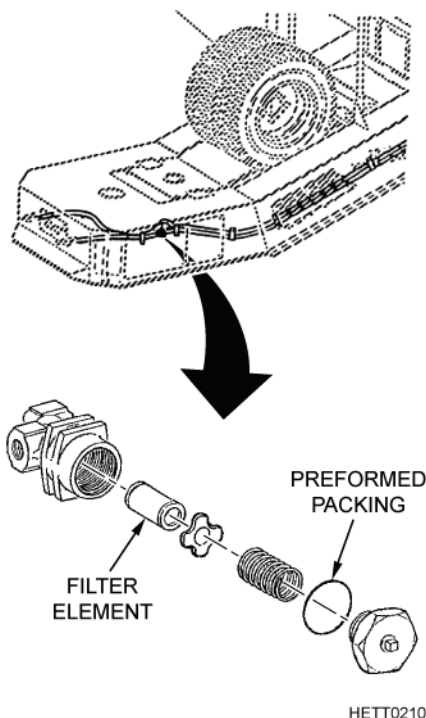
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
66	Quarterly	Axle System	 <p>Figure 61. Axle Assembly.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Measure the travel of the brake chamber clevis from the fully released "A" position to the fully applied "B" position on all ten suspensions. 2. Perform the brake adjustment (WP 0037) as required if travel distance of clevis is 2 in. (5.1 cm) or more. 	

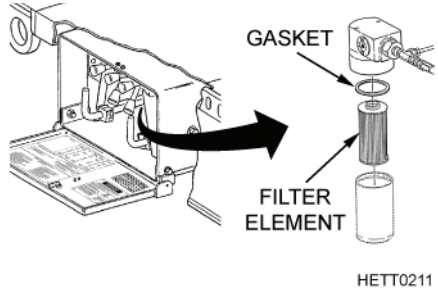
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
67	Quarterly	Starter	 <p>Figure 62. Starter.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect the cables for corrosion. <ol style="list-style-type: none"> a. Inspect the cables for frayed or broken wires. 	

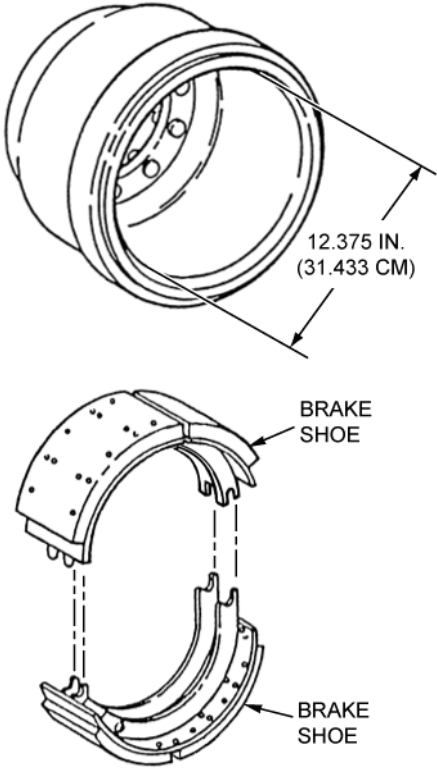
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
68	Annually	Gooseneck Pneumatic Installation	<p><u>WARNING</u></p>  <p>If NBC exposure is suspected, all air filter media should be handled by personnel wearing protective equipment. Consult your unit NBC Officer or NBC NCO for appropriate handling or disposal instructions. Failure to follow this warning may result in injury to personnel.</p>  <p>Figure 63. Gooseneck Pneumatic Installation.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Check the connections, lines, and hoses for fraying, nicks, cuts, abrasion, and leaks (WP 0073). <ol style="list-style-type: none"> a. Replace all worn or damaged parts. 2. Replace the filter element and preformed packing (WP 0072). 	

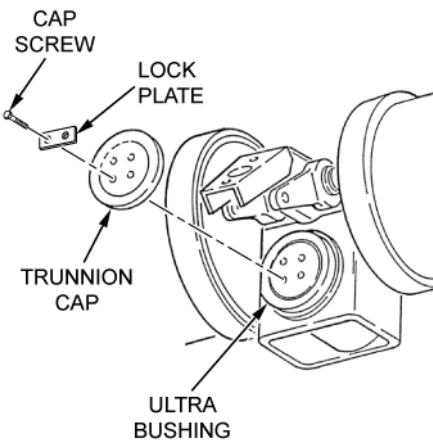
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
69	Annual	Platform Hydraulic Installation	<p style="text-align: center;">NOTE</p> <p style="text-align: center;">Inspect all ten suspension assemblies.</p>  <p style="text-align: center;">HETT0211</p> <p style="text-align: center;">Figure 64. Platform Hydraulic Installation.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Check the hoses, lines, and connections for cuts, nicks, chafing, and leaks (WP 0124 and/or WP0125). 2. Replace all worn or damaged parts. 3. Replace the filter element and gasket (WP 0043). <ol style="list-style-type: none"> a. Fill filter with clean hydraulic fluid (WP 0163). 4. Check the suspension hydraulic hoses, lines, and fittings for cuts, nicks, corrosion, and signs of chafing or leaks. <ol style="list-style-type: none"> a. Replace any worn or damaged parts (WP 0124). 	






PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
70	Annually	Brake Drums and Brake Shoes	 <p style="text-align: right;">HETT0213</p> <p>Figure 65. Brake Drums and Brake Shoes.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Check the brake drums and brake shoes for excessive/unusual wear and scoring. The brake drums (WP 0075) must have a maximum ID less than 12.375 in. (31.433 cm). The brake shoes (WP 0068), measured at center of each shoe, must be a minimum of 0.46 in. (1.17 cm) thick. 2. If any rivets are flush with or higher than any portion of the brake lining, that brake shoe assembly must be replaced. Replace or repair the brake shoe assembly as necessary (WP 0068). 	

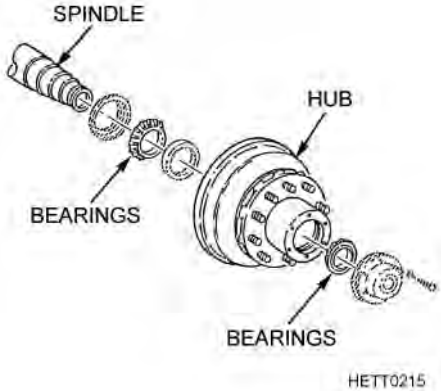
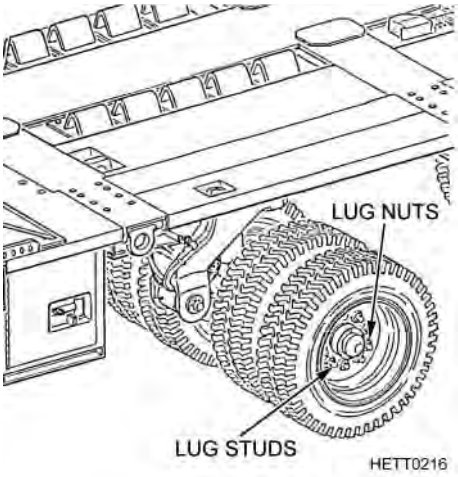
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
71	Annually	Suspension Assembly	<p style="text-align: center;">NOTE</p> <p>Some fraying of a new ultra bushing may occur as a new bushing wears in. Minor fraying of the urethane part of the bushing protruding beyond the axle housing over the trunnion cap is common and should be removed when found.</p>  <p style="text-align: right;">HETT0214</p> <p style="text-align: center;">Figure 66. Suspension Assembly.</p> <ol style="list-style-type: none"> 1. Check the ultra bushing for signs of deterioration and fraying of the urethane part of the bushing on all ten suspension assemblies. 2. Straighten two corners of each lock plate if the urethane portions of the ultra bushing are frayed. 3. Remove four capscrews, two lock plates, and the trunnion cap from the ultra bushing. 4. Use a knife to trim all the frayed strands off of the ultra bushing. <ol style="list-style-type: none"> a. If a gap of 0.125 in. (0.32 cm) or more exists between the urethane and either metal shell at the top of the ultra bushing, notify sustainment maintenance. 5. After the trimming is complete, install a trunnion cap and secure with two lock plates and four capscrews. 	

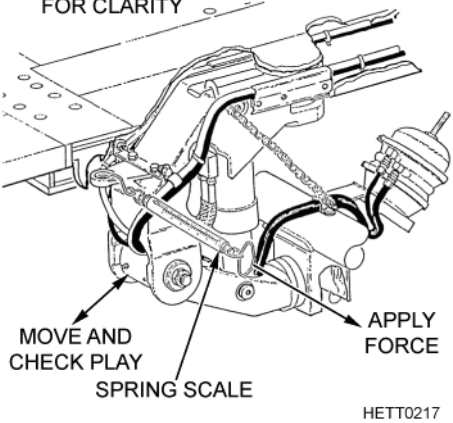
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
			a. Use a torque wrench (WP 0169) to torque the capscrews to 230 to 250 lb-ft (312 to 339 Nm). 6. Bend one corner at each end of the lock plate against a flat side of the capscrew to secure each capscrew.	
72	Annually	Wheel Assembly	<p style="text-align: center;">WARNING</p> <div style="display: flex; justify-content: center; gap: 10px;">      </div> <p style="text-align: center;">SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)</p> <ul style="list-style-type: none"> • Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition. • The flashpoint for Type II solvent cleaning compound is 141°F to 198°F (61°C to 92°C) and for Type III it is 200°F to 241°F (93°C to 116°C). • Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment. • Fire extinguishers should be placed nearby when using solvent cleaning compound. • Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures. • Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury. <p>Failure to follow these warnings may result in serious injury or death to personnel.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Disassemble the wheel assemblies (WP 0075). 	

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
			 <p>Figure 67. Wheel Assembly.</p> <ol style="list-style-type: none"> 2. Clean the bearings, hubs, and spindles with dry cleaning solvent (WP 0170). 3. Inspect any parts that were removed for wear, scoring and discoloration, scratches, and burrs. 4. Repack the bearings with grease (WP 0170). 	
73	Annually	Lug Nuts and Lug Studs	 <p>Figure 68. Lug Nuts and Lug Studs.</p> <ol style="list-style-type: none"> 1. Check all lug nuts and lug studs for proper torque of 450 to 500 lb-ft (610 to 678 Nm). <ol style="list-style-type: none"> a. Use a torque wrench (WP 0169) to torque all lug nuts and lug studs as required if loose (WP 0078, WP 0079, WP 0080, or WP 0081). 	

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
74	Annually	Suspension Spindle Bearing	<p>WHEELS REMOVED FOR CLARITY</p>  <p>Figure 69. Suspension Spindle Bearing.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Isolate, chain up, and connect disconnected links for each bogie (WP 0080). 2. Apply force to the bogie using the spring scale as shown. The suspension must turn with no more than 100 lb (45.4 kg) of force applied. 3. If more than 100 lb (45.4 kg) of force is required to turn the suspension, check for lubrication and looseness. <ol style="list-style-type: none"> a. Attempt to move the upper suspension/lower suspension arm joint in the fore and aft direction to check for play. b. Repeat with the bogie turned 90 degrees. 4. If movement exceeds 0.25 in. (0.6 cm), release the spindle nut setscrew and check the spindle nut torque (WP 0065). 	<p>Torque is correct, yet movement remains.</p> <p>Tightening the spanner nut causes turning force to exceed 100 lb (45.4 kg).</p>
75	Annually	Platform Weldment	<p>Driver</p> <ol style="list-style-type: none"> 1. Check the entire platform for wear, cracks, broken or defective welds, loose or missing hardware, deformed components, rust, or corrosion. <ol style="list-style-type: none"> a. Repair as required (WP 0147). b. Refer defective welds to sustainment maintenance. 	

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED


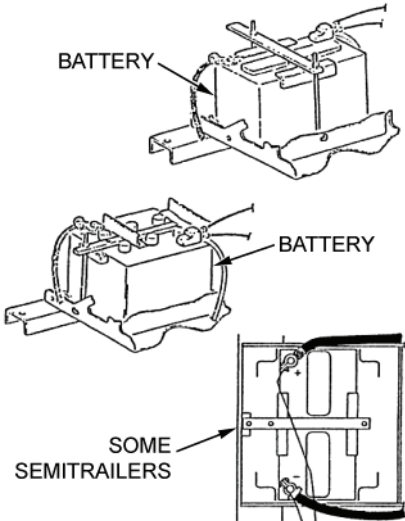

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
76	Annually	Battery	<p style="text-align: center;"><u>WARNING</u></p>  <ul style="list-style-type: none"> • Do not wear watches, rings, or other jewelry that could short out battery terminals while servicing battery. Do not smoke or use open flame around batteries. Battery may explode from a spark. Battery acid is harmful to skin and eyes. Wear protective goggles to prevent injury to personnel when working with batteries. • On some semitrailers a solar battery charger is mounted to top of gooseneck directly in front of spare tires. Persons working on top of gooseneck must take EXTREME care not to step on it or trip over it. <p>Failure to follow these warnings may result in injury to personnel or damage to equipment.</p>  <p style="text-align: center;">BATTERY</p> <p style="text-align: center;">BATTERY</p> <p style="text-align: center;">SOME SEMITRAILERS</p> <p style="text-align: center;">ALTERNATE BATTERY INSTALLATION</p> <p style="text-align: right;">HETT0218</p>	

Figure 70. Battery.

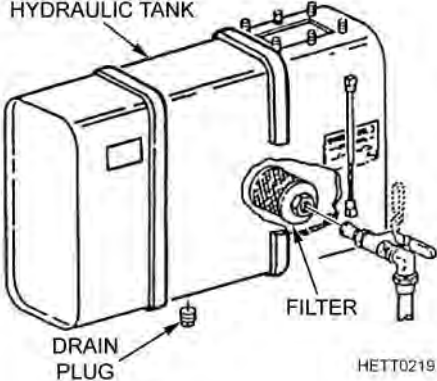
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
			Driver <ol style="list-style-type: none"> 1. Disconnect or remove the battery as required (WP 0053). 2. Check all terminals for corrosion. <ol style="list-style-type: none"> a. Remove all corrosion with a wire brush, followed by a solution of sodium bicarbonate (WP 0170) and water. 3. Apply petroleum jelly (WP 0170) to terminals. 4. Reconnect or install the battery as required (WP 0053). 5. If a solar battery charger is installed, ensure that the leads are securely attached to the battery terminals. 6. Visually check the electrolyte level. <ol style="list-style-type: none"> a. The electrolyte level should cover the plates. If necessary, add distilled water until the electrolyte level has reached the proper level. 7. Check the specific gravity of electrolyte in each cell using a hydrometer (WP 0069). Refer to TM 9-6140-200-14. 	
77	Annually	Gooseneck Hydraulics	<ol style="list-style-type: none"> 1. Check the gooseneck hydraulic hoses, lines, and fittings for cuts, nicks, corrosion, and signs of chafing or leaks. 2. Replace any worn or damaged parts (WP 0116). 	


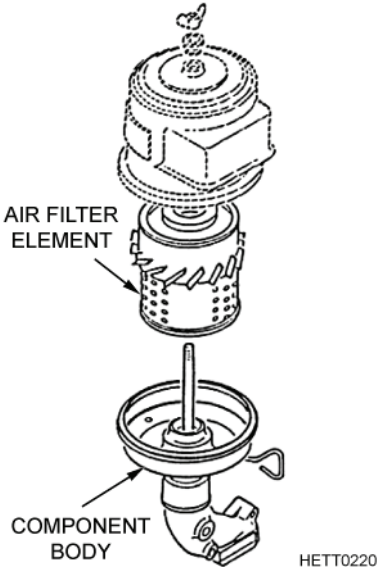
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
78	Annually	Hydraulic Tank	<p style="text-align: center;">WARNING</p>  <p style="text-align: center;">SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)</p> <ul style="list-style-type: none"> • Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition. • The flashpoint for Type II solvent cleaning compound is 141°F to 198°F (61°C to 92°C) and for Type III it is 200°F to 241°F (93°C to 116°C). • Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment. • Fire extinguishers should be placed nearby when using solvent cleaning compound. • Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures. • Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury. <p>Failure to follow these warnings may result in serious injury or death to personnel.</p>	

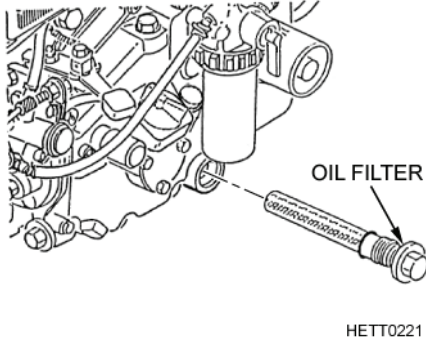
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
			 <p>Figure=71. Hydraulic Tank.</p> <ol style="list-style-type: none"> 1. Remove tank filter (WP 0123). 2. Clean the filter using dry cleaning solvent (WP 0170) from the inside to outward. 3. Replace the filter if damaged or clogged (WP 0043). 4. Check the drain plug for metal particles and clean with a rag (WP 0170). 	

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
79	Annually	Air Filter	<p style="text-align: center;"><u>WARNING</u></p> <div style="text-align: center;">  </div> <p>If NBC exposure is suspected, all air filter media should be handled by personnel wearing protective equipment. Consult your unit NBC Officer or NBC NCO for appropriate handling or disposal instructions. Failure to follow this warning may result in injury to personnel.</p> <div style="text-align: center;">  <p style="text-align: right;">HETT0220</p> </div> <p style="text-align: center;">Figure 72. Air Filter.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Replace the air filter element if damaged or clogged. <ol style="list-style-type: none"> a. Wipe out the component body with a clean rag (WP 0170). 	


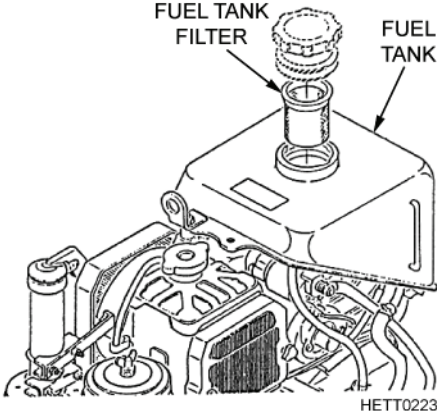
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
80	Annually	Oil Filter	 <p>Figure 73. Oil Filter.</p> <p>Driver</p> <ol style="list-style-type: none">1. Clean oil filter and change oil (WP 0132).<ol style="list-style-type: none">a. Replace oil filter if damaged or defective (WP 0132).	

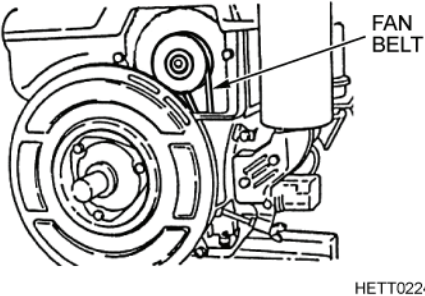
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
81	Annually	Air Filter	<p style="text-align: center;"><u>WARNING</u></p> <div> </div> <p>If NBC exposure is suspected, all air filter media should be handled by personnel wearing protective equipment. Consult your unit NBC Officer or NBC NCO for appropriate handling or disposal instructions. Failure to follow this warning may result in injury to personnel.</p> <div> </div> <p style="text-align: center;">Figure 74. Air Filter.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Replace the air filter element if damaged or clogged. <ol style="list-style-type: none"> a. Wipe out the component body with a clean rag (WP 0170). 	


PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
82	Annually	Fuel Tank	<p><u>WARNING</u></p>  <p>Fuel is flammable. To avoid serious injury, keep all smoking materials, sparks, or open flames away from the fuel tank and fuel system. Failure to follow this warning may result in injury to personnel.</p>  <p>Figure 75. Fuel Tank.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Clean the filter with clean diesel fuel (WP 0170). Replace the filter if damaged (WP 0137). 2. Check the exterior and interior of the fuel tank for contamination or corrosion (WP 0137). <ol style="list-style-type: none"> a. Flush, if necessary, with diesel fuel (WP 0170). 	

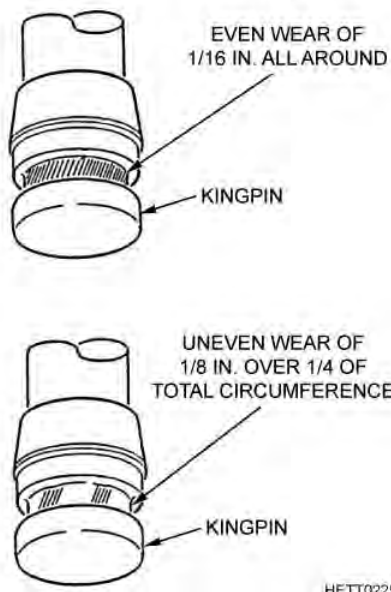
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
83	Annually	Fan Belt	 <p>Figure 76. Fan Belt.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Check fan belt for wear and deterioration (WP 0143). <ol style="list-style-type: none"> a. Check tension of fan belt. b. Adjust or replace fan belt as necessary (WP 0143). 	

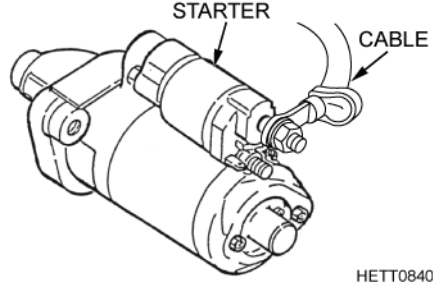
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
84	Annually	Kingpin	<p style="text-align: center;"><u>WARNING</u></p>  <p style="text-align: center;">SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)</p> <ul style="list-style-type: none"> • Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition. • The flashpoint for Type II solvent cleaning compound is 141°F to 198°F (61°C to 92°C) and for Type III it is 200°F to 241°F (93°C to 116°C). • Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment. • Fire extinguishers should be placed nearby when using solvent cleaning compound. • Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures. • Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury. <p>Failure to follow these warnings may result in serious injury or death to personnel.</p> <ol style="list-style-type: none"> 1. Clean the kingpin wear surfaces using rags and dry cleaning solvent (WP 0170). 	

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
			 <p>Figure 77. Kingpin.</p> <ol style="list-style-type: none"> 2. Inspect the condition of the kingpin. 3. Notify sustainment maintenance that the kingpin must be replaced if any of the following conditions exist: <ol style="list-style-type: none"> a. Uneven wear on one or more sides of the kingpin wear surface resulting in wear of 1/8 in. (0.32 cm) over 1/4 of circumference of the kingpin. b. Even wear over the kingpin surface causing the diameter to be reduced by 1/8 in. (0.32 cm). c. A crack of any size is noted anywhere on the kingpin. d. A nick, chip, or gouge deeper than 1/4 in. (0.64 cm) is found anywhere on the kingpin wear surface. 	

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICES	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
85	Annually	Starter	 <p>Figure 78. Starter.</p> <p>Driver</p> <ol style="list-style-type: none"> 1. Inspect cables for corrosion. <ol style="list-style-type: none"> a. Inspect the cables for frayed or broken wires. 	
86	Annually	Auxiliary Power Unit Jump Start System	<p>Driver</p> <ol style="list-style-type: none"> 1. Inspect cables for corrosion. <ol style="list-style-type: none"> a. Inspect the cables for frayed or broken wires. b. Inspect the cables for defective terminal lugs or battery clamps. 	

END OF WORK PACKAGE

CHAPTER 5
MAINTENANCE INSTRUCTIONS
FOR
SEMITRAILER, TRANSPORTER, HEAVY EQUIPMENT 70 TON, M1000

FIELD MAINTENANCE
SERVICE UPON RECEIPT OF MATERIAL

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK) (WP 0168, Item 11)
Strobe Light Assembly (WP 0169, Item 37)
Warning Light Kit (WP 0169, Item 38)

Materials/Parts

Antifreeze (WP 0170, Item 2)
Strap, Tiedown, Electrical (WP 0170, Item 33)
Rag, Wiping, Cotton (WP 0170, Item 23)
Tape, Insulation, Electrical (WP 0170, Item 35)

Personnel Required

1

References

WP0006
WP0007
WP 0008
WP 0009
WP 0010
WP 0011
WP 0012
WP 0013
WP 0035
WP 0053
WP 0087
WP 0136
WP 0137
WP 0142
WP 0163
DD Form 6
DA PAM 738-750
TM 9-2330-381-24P
WP 00169

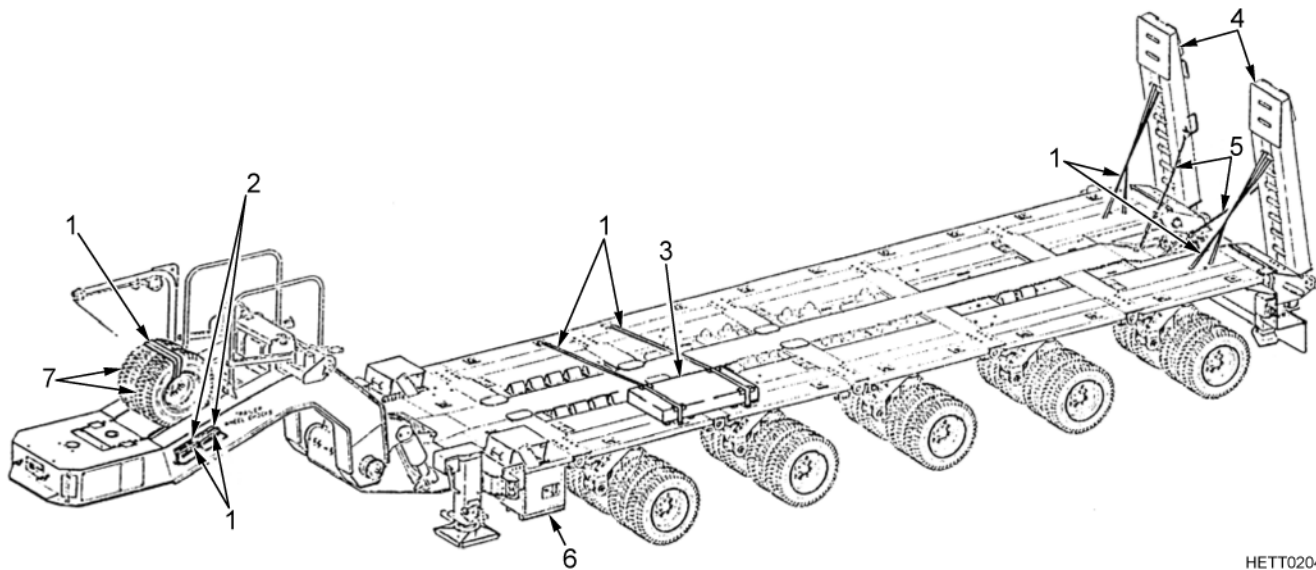
GENERAL

This work package contains instructions for unpacking, inspection/servicing, and operational checks of the Heavy Equipment Transporter (HET) semitrailer.

UNPACKING**NOTE**

Check the information on all of the storage and shipment labels on the semitrailer, and then remove the labels.

1. Remove documents from platform stowage compartment (Figure 1, Item 6).
2. Cut and remove steel strapping (Figure 1, Item 1) from two spare tires (Figure 1, Item 7), four wheel chocks (Figure 1, Item 2) (two mounted on each side of gooseneck), and Basic Issue Items/On Vehicle Equipment (BII/OVE) shipping box (Figure 1, Item 3).
3. Ensure safety chains (Figure 1, Item 5) of loading ramps (Figure 1, Item 4) are properly connected to platform (WP 0009).
4. Cut and remove steel strapping (Figure 1, Item 1) from each loading ramp (Figure 1, Item 4).
5. Open wooden BII/OVE shipping box (Figure 1, Item 3) and remove, unwrap, and inspect each item as it is unpacked. Remove preservative materials from items using wiping rag (WP 0170).
6. Inspect items for rust, corrosion, or damage. Discard individual wrappings and cushioning materials. Retain shipping box (Figure 1, Item 3) for future use.
7. Refer to BII (WP 0169) and OVE listings to inventory all items removed from shipping box (Figure 1, Item 3) and/or items shipped mounted on semitrailer. Report missing items in accordance with DA PAM 738-750. Report damaged items on DD Form 6, Packaging Improvement Report.



HETT0204

Figure 1. Semitrailer Platform.

8. Install two shackles (Figure 2, Item 9) on recovery eyes (Figure 2, Item 2) at rear of semitrailer platform (Figure 2, Item 8).
9. Alter crowbar (Figure 2, Item 4) using pedestal grinder (GMTK) to scribe three platform height markings as follows:
 - a. Make first mark at 34 in. (86 cm) from knife edge of crowbar.
 - b. Make second mark at 43 in. (109 cm) from knife edge of crowbar.
 - c. Make third mark at 50 in. (127 cm) from knife edge of crowbar.
 - d. Repaint grinded areas as required.
10. Unfasten linch pin (Figure 2, Item 5) and remove hitch pin (Figure 2, Item 7) from mounting bracket (Figure 2, Item 6) at rear of platform (Figure 2, Item 8) beneath loading ramps (Figure 2, Item 1).
11. Install crowbar (Figure 2, Item 4) and isolation valve handle extension (Figure 2, Item 3) in mounting brackets (Figure 2, Item 6).
12. Reinstall hitch pin (Figure 2, Item 7) and secure with linch pin (Figure 2, Item 5).

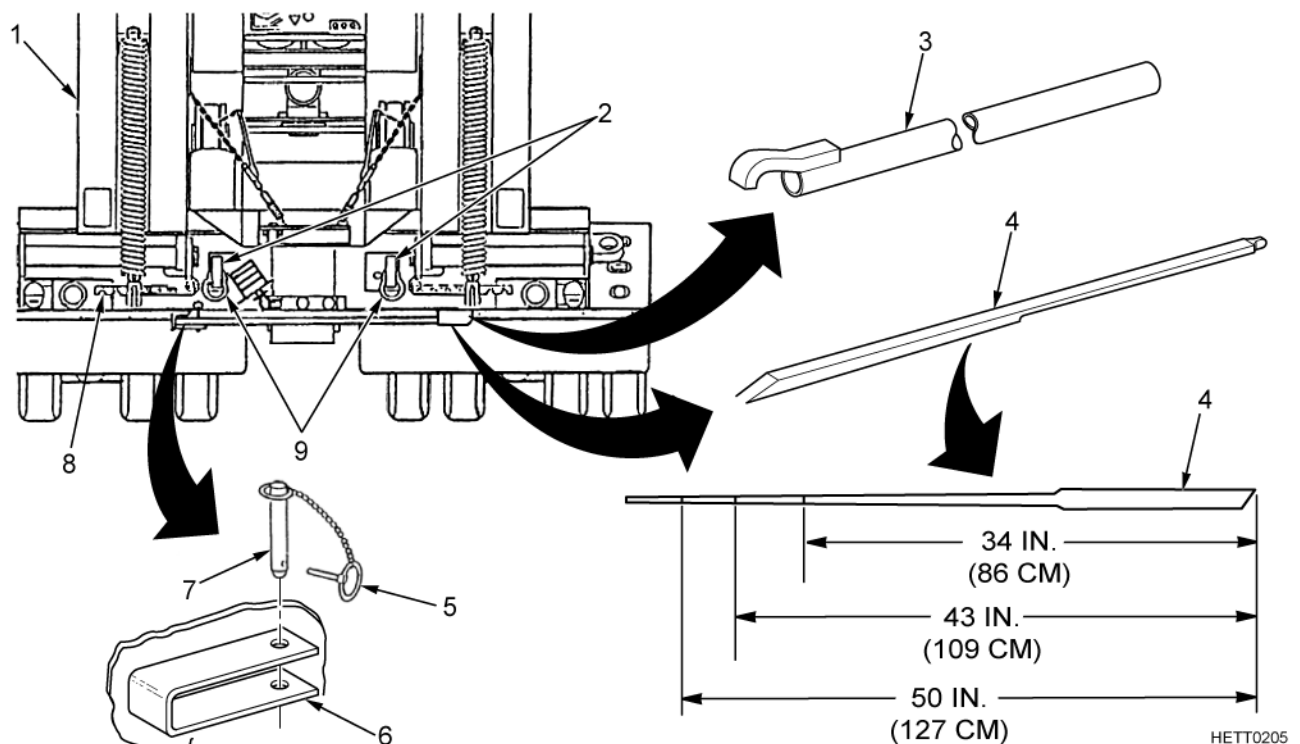


Figure 2. Rear of Semitrailer.

13. Remove preservative material from pistons of two gooseneck pivot cylinders (Figure 3, Item 5), two gooseneck-mounted steering cylinders (Figure 3, Item 6), and two platform-mounted steering cylinders (Figure 3, Item 3) with wiping rag (WP 0170).
14. Lower both front support legs (Figure 3, Item 4) and rear support legs (Figure 3, Item 2). Refer to WP 0011 and WP 0012.
15. Remove preservative material from support leg extensions using a wiping rag (WP 0170).
16. Return both front support legs (Figure 3, Item 4) and rear support legs (Figure 3, Item 2) to stowed position (WP 0011 and WP 0012).
17. Remove tape from around dummy couplings (Figure 3, Item 1) and gladhand connections (Figure 3, Item 7). Discard tape.

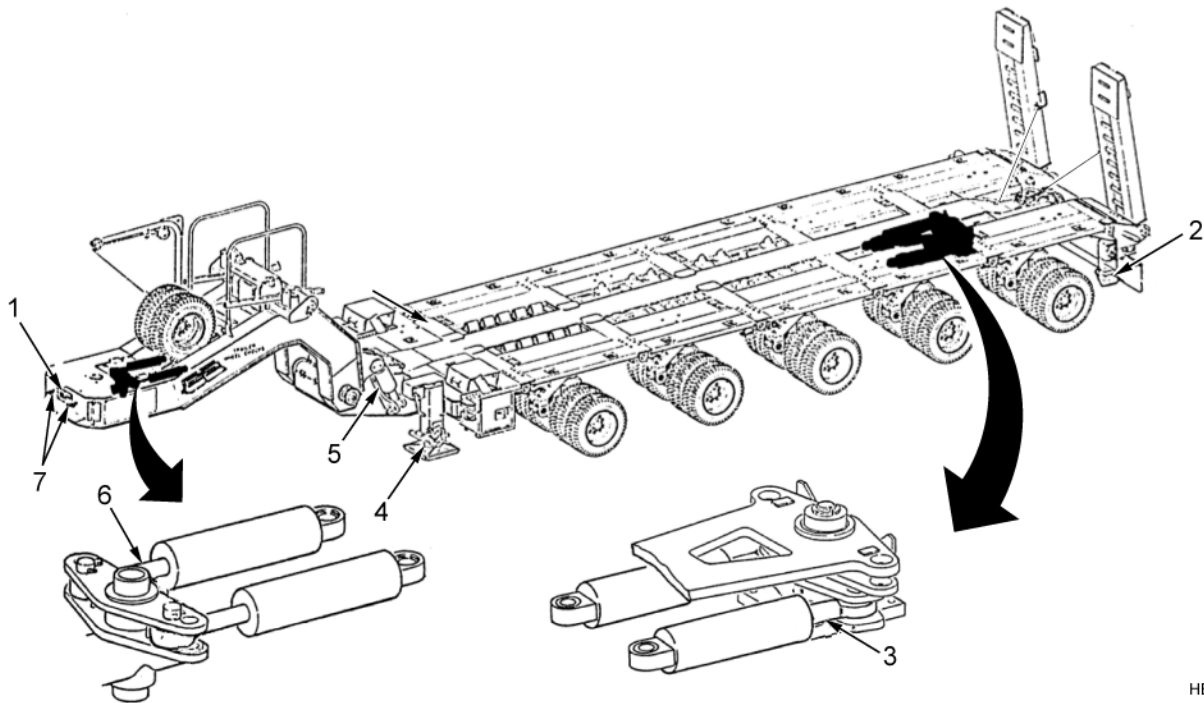


Figure 3. Gooseneck and Steering Cylinders.

18. Secure following components from the Warning Light Kit (WP 0169):

- Lockwasher (2)
- Clamp
- Pole Mount Bracket
- L-Bracket
- Triangle Plate
- Adapter (2)
- Ground Cable Assembly
- Pipe
- Bolt (3)
- Bolt (2)
- Bolt (2)
- Lead (2)
- Cable Assembly

19. Secure following components from the Strobe Light Assembly (WP 0169):

- Strobe Light Assembly
- Screw (3)
- Gasket
- Locknut (3)

20. Disconnect intervehicular cable from semitrailer (WP 0013).
21. Assemble clamp (Figure 4, Item 3), L-bracket (Figure 4, Item 4), and pole mount bracket (Figure 4, Item 5) with two bolts (Figure 4, Item 7) and lockwashers (Figure 4, Item 6).

CAUTION

Ensure the clamp does not contact the lens on the vehicular bar lamp or damage to the lens may result.

22. Install three bolts (Figure 4, Item 2) on clamp (Figure 4, Item 3).
23. Install entire clamp assembly (Figure 4, Item 3) (single mounting bolt side up) onto lower edge of vehicular bar lamp mount (Figure 4, Item 8) between streetside and center lamps (Figure 4, Item 1). Tighten three bolts (Figure 4, Item 2) evenly.

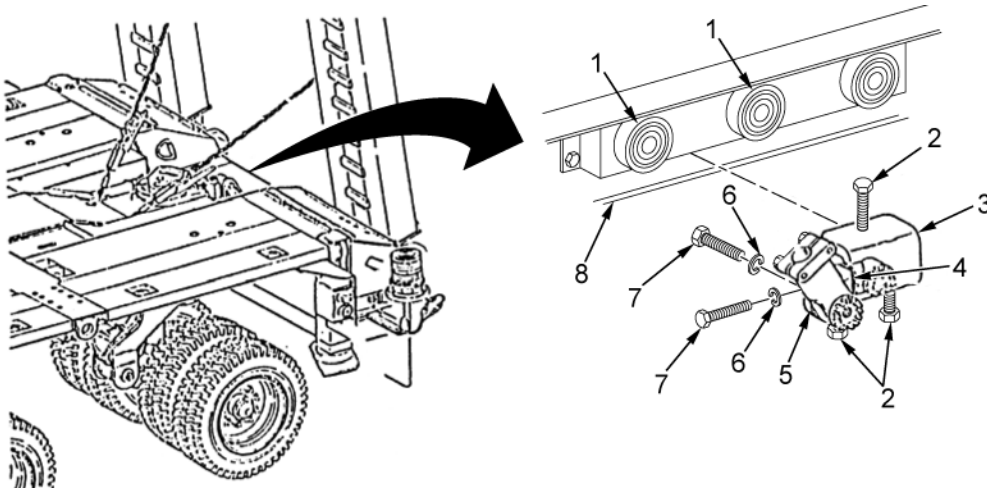
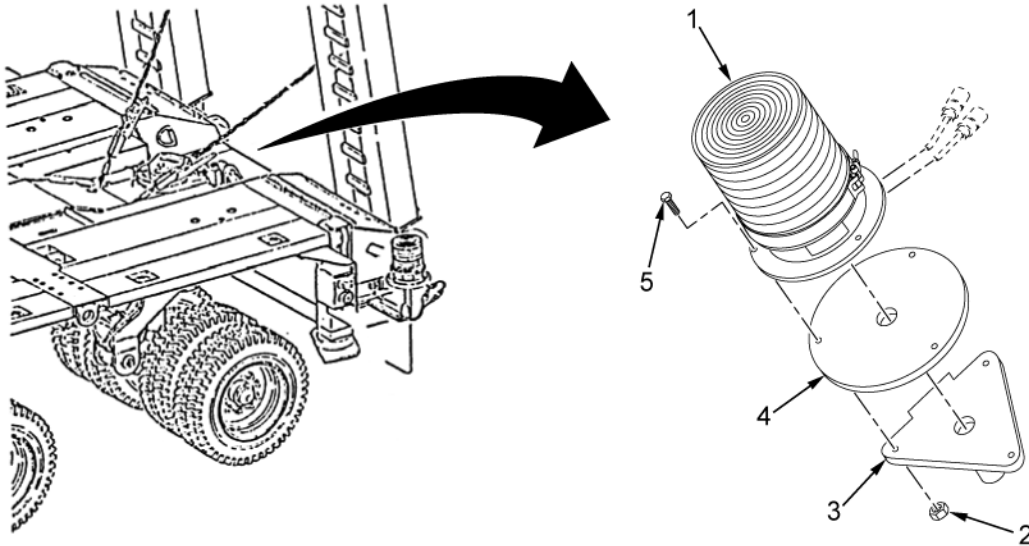


Figure 4. Semitrailer Light.

CAUTION

Ensure the leads are not crimped in between the light and gasket or damage to leads may result.

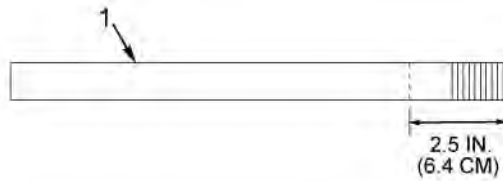
24. Install beacon warning light (Figure 5, Item 1) and gasket (Figure 5, Item 4) onto triangle plate (Figure 5, Item 3).
25. Secure beacon warning light (Figure 5, Item 1) with three screws (Figure 5, Item 5) and locknuts (Figure 5, Item 2).



HETT0830

Figure 5. Beacon Warning Light.

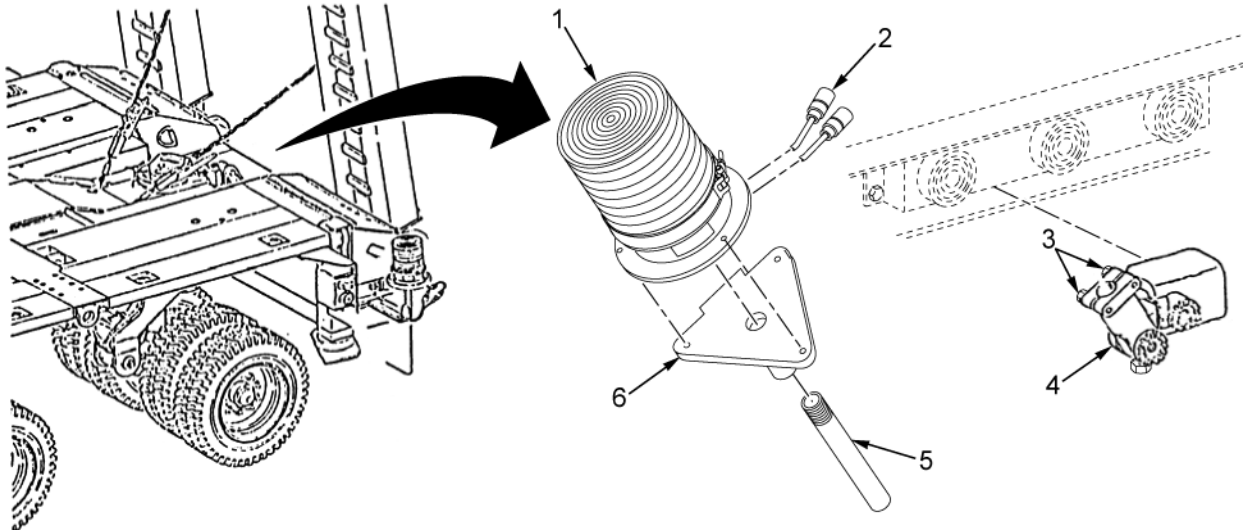
26. Use hacksaw (WP 0168) to cut pipe (Figure 6, Item 1) to length of 2.5 in. (6.4 cm) including threads.



HETT0811

Figure 6. Pipe.

27. Thread pipe (Figure 7, Item 5) into bottom of triangle plate (Figure 7, Item 6). Tighten pipe.
28. Insert pipe (Figure 7, Item 5) into pole mount bracket (Figure 7, Item 4).
29. With wires (Figure 7, Item 2) facing toward front of semitrailer, tighten two screws (Figure 7, Item 3) to secure beacon warning light (Figure 7, Item 1).



HETT0831

Figure 7. Beacon Warning Light.

NOTE

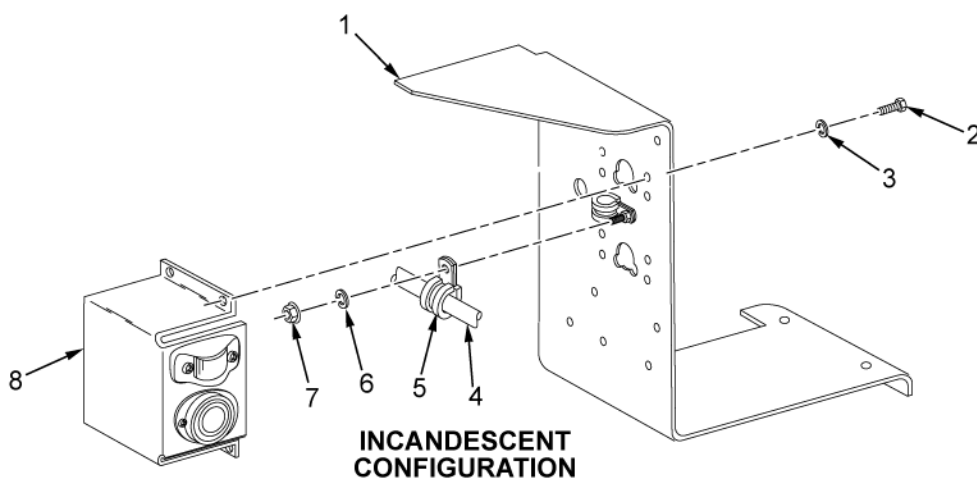
Ensure the intervehicular cable (electrical cable) is not connected to the semitrailer.

30. Remove four capscrews (Figure 8, Item 2), lockwashers (Figure 8, Item 3), and access cover (Figure 8, Item 8) from streetside deflector (Figure 8, Item 1).

NOTE

Ensure the side clearance light wire is disconnected from the harness. Move the access cover, with the clearance light installed, out of the way.

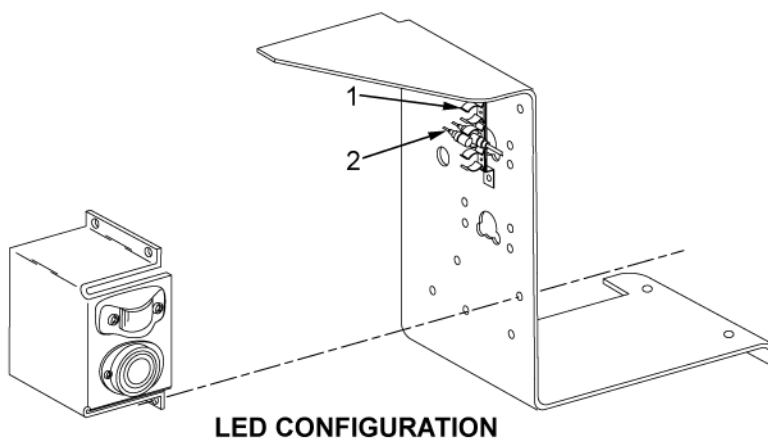
31. For incandescent lights, remove locknut (Figure 8, Item 7), lockwasher (Figure 8, Item 6), and clamp loop (Figure 8, Item 5) securing harness (Figure 8, Item 4) to deflector (Figure 8, Item 1). Discard locknut and lockwasher.
32. Reinstall clamp loop (Figure 8, Item 5) without harness (Figure 8, Item 4).



HETT0208

Figure 8. Incandescent Lights.

33. For light emitting diode (LED) lights, remove center connector (Figure 9, Item 2) from connector clip (Figure 9, Item 1).



HETT0832

Figure 9. LED Lights.

34. Disconnect clearance light wire No. 489 (Figure 10, Item 6) from harness wire No. 21-489 (Figure 10, Item 12).
35. Install jumper lead (Figure 10, Item 10) and adapter (Figure 10, Item 11) on harness wire No. 21-489 (Figure 10, Item 12).

NOTE

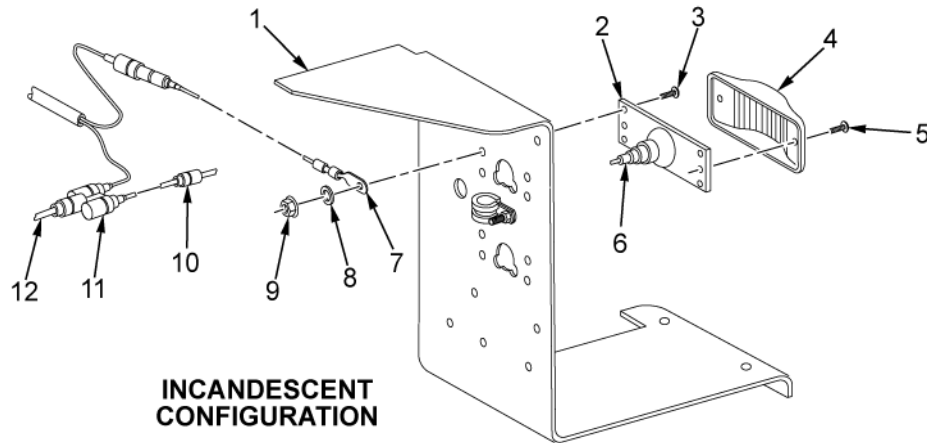
Perform steps 36 through 39 to install the ground lead on an incandescent light.

36. Remove two screws (Figure 10, Item 5) and lens cover (Figure 10, Item 4) from rear clearance light (Figure 10, Item 2).
37. Remove screw (Figure 10, Item 3), locknut (Figure 10, Item 9), and lockwasher (Figure 10, Item 8) from rear clearance light (Figure 10, Item 2) and streetside deflector (Figure 10, Item 1). Discard lockwasher and locknut.

NOTE

Ensure the ground lead is in contact with bare metal and is positioned not to interfere with the installation of the access cover.

38. Install screw (Figure 10, Item 3), ground lead (Figure 10, Item 7), lockwasher (Figure 10, Item 8), and locknut (Figure 10, Item 9) on streetside deflector (Figure 10, Item 1) and rear clearance light (Figure 10, Item 2).
39. Install lens cover (Figure 10, Item 4) on rear clearance light (Figure 10, Item 2) with two screws (Figure 10, Item 5).



HETT0833

Figure 10. Incandescent Lights.

NOTE

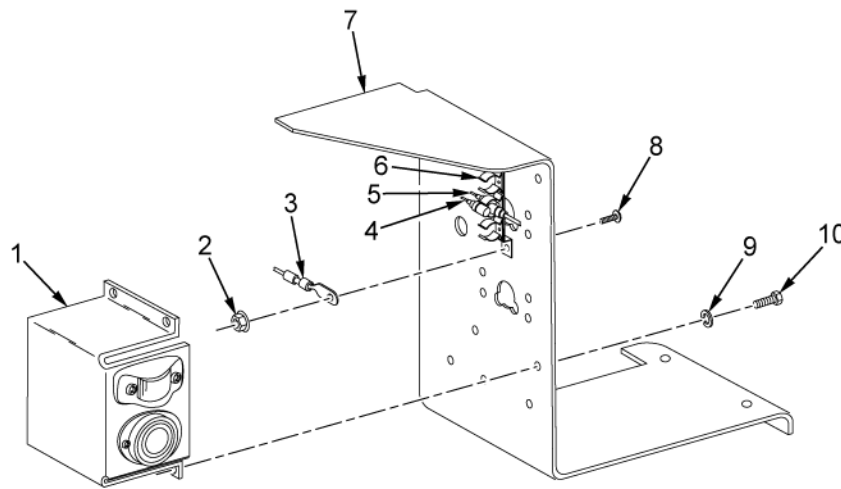
Perform steps 40 through 44 to install the ground lead on a LED light.

40. Remove locknut (Figure 11, Item 2) and screw (Figure 11, Item 8) from bottom mount hole of connector clip (Figure 11, Item 6). Discard locknut.

NOTE

Ensure the ground lead is in contact with bare metal and is positioned not to interfere with the installation of the access cover.

41. Install screw (Figure 11, Item 8), ground lead (Figure 11, Item 3), and locknut (Figure 11, Item 2) to bottom mount hole of connector clip (Figure 11, Item 6).
42. Insert adapter (Figure 11, Item 4) into center of connector clip (Figure 11, Item 5).
43. Install access cover (Figure 11, Item 1) on streetside deflector (Figure 11, Item 7) with four lockwashers (Figure 11, Item 9) and capscrews (Figure 11, Item 10).
44. Return remaining items removed from shipping box to unit supply.



LED CONFIGURATION

HETT0783

Figure 11. LED Lights.

END OF TASK

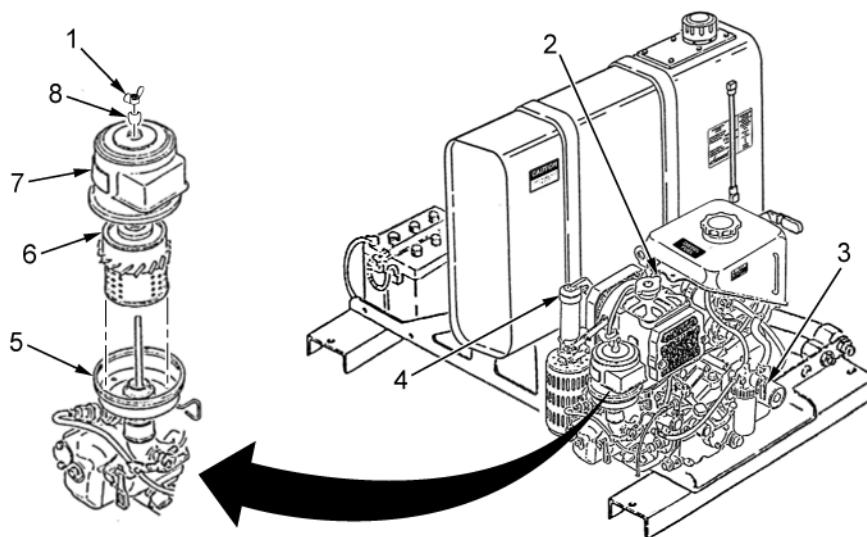
INSPECTION/SERVICING**CHECKING UNPACKED EQUIPMENT**

1. Gain access to Auxiliary Power Unit (APU) on gooseneck (WP 0035).
2. Check tag on APU crankcase dipstick to determine if oil requires changing. If required, change oil and filter (WP 0163).
3. Remove tag from radiator neck (Figure 12, Item 2).
4. Check coolant level (WP 0142) and replenish, if required, with equal parts of water and antifreeze (WP 0170).

WARNING

If Nuclear, Biological, or Chemical (NBC) exposure is suspected, all air filter media should be handled by personnel wearing protective equipment. Consult your unit NBC Officer or NBC NCO for appropriate handling or disposal instructions. Failure to follow this warning may result in injury to personnel.

5. Remove wingnut (Figure 12, Item 1), grommet (Figure 12, Item 8), air cleaner cover (Figure 12, Item 7), and air filter (Figure 12, Item 6) from air inlet (Figure 12, Item 5). Remove tape and paper from opening of air inlet.
6. Remove tape from exhaust pipe opening under rain cap (Figure 12, Item 4).
7. Remove tag from fuel filter petcock (Figure 12, Item 3).
8. Remove fuel filter element and drain preservative oil into drain pan. Install new filter element. Refer to WP 0137.



HETT0209

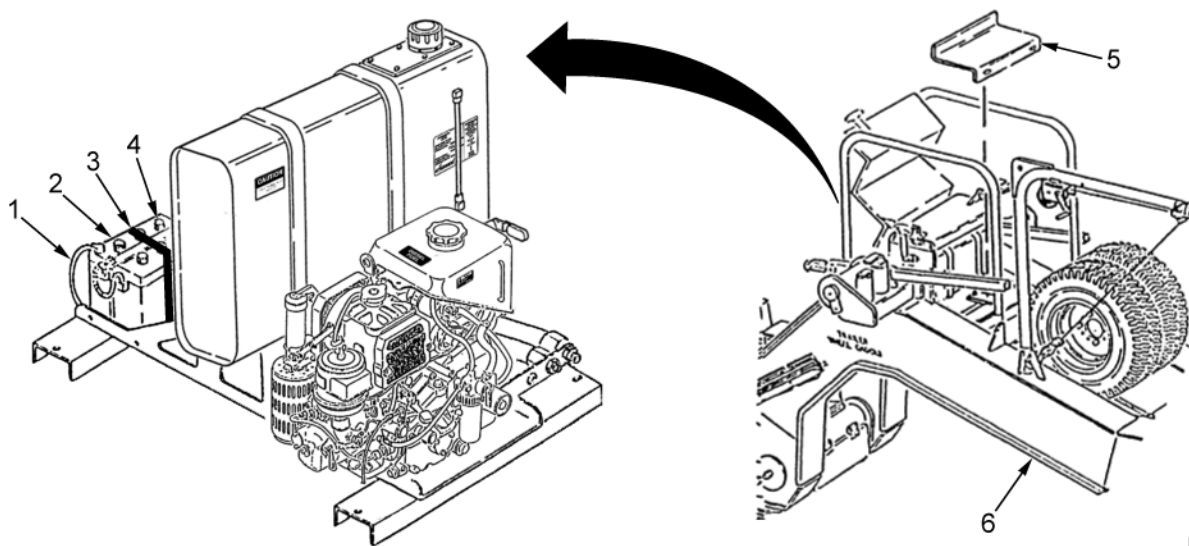
Figure 12. Inspection/Servicing.

9. Drain fuel tank (WP 0136).
10. Refill APU fuel tank with proper grade of fuel (WP 0163).

WARNING

DO NOT wear watches, rings, or other jewelry that could short out the battery terminals while servicing the battery. **DO NOT** smoke or use open flames around the battery. The battery may explode from a spark. Battery acid is harmful to skin and eyes. Wear protective goggles to prevent injury to personnel when working with battery. Failure to follow this warning may result in injury to personnel.

11. Remove forward step assembly (Figure 13, Item 5) from gooseneck (Figure 13, Item 6) to gain access to battery (Figure 13, Item 2). Refer to WP 0087.
12. Cut and remove steel strapping (Figure 13, Item 3) from battery (Figure 13, Item 2).
13. Remove battery filler caps (Figure 13, Item 4) and barrier material.
14. Check level of electrolyte with hydrometer (GMTK). Top off fluid level with distilled water.
15. Charge battery, if required, using battery charger (GMTK).
16. Replace filler caps (Figure 13, Item 4).
17. Inspect and clean battery terminals and cables (Figure 13, Item 1). Reconnect battery cables. Refer to WP 0053.
18. Perform monthly (M) lubrication (WP 0163).
19. Perform semiannual (S) and annual (A) Preventive Maintenance Checks and Services (PMCS) (WP 0035).



HETT0834

Figure 13. Inspection/Servicing.

END OF TASK

OPERATIONAL CHECKS**PRELIMINARY CHECKS and ADJUSTMENT of EQUIPMENT****NOTE**

Perform the following checks and observe for binding, jerky movement, and unusual noises. If any malfunction occurs, stop the operation and investigate the cause. If after all checks have been completed the semitrailer does not malfunction, the semitrailer is ready for full operation.

1. Perform operator/crew before (B) PMCS (WP 0035).
2. Start and run APU to remove preservative oil. Run APU at half throttle until remaining preservative oil has run through fuel system. When engine operation (running) smooths out and excessive smoking stops, proceed with remaining checks (WP 0005 or WP 0006).
3. Adjust gooseneck (WP 0007).
4. Adjust platform height (WP 0008).
5. Operate spring ramps (WP 0009).
6. Couple tractor/semitrailer (WP 0013).
7. Operate manual steering (WP 0010).
8. Tow semitrailer and adjust tracking (WP 0010).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

SERVICE BRAKE ADJUSTMENT

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK) (WP 0168, Item 11)

Tght gpegu

WP0004

WP 0014

WP 0035

TM 9-2320-360-10

Materials/Parts

Locknut (2) (TM 9-2330-381-24P)

"

'Rgt uqppgnTgs wlt gf

2

Equipment Conditions

Platform set at road height (WP 0008)

Semitrailer parked on level ground and coupled to tractor (WP 0013)

GENERAL INFORMATION

This work package contains instructions for the service brake adjustment of the Heavy Equipment Transporter (HET) semitrailer.

SERVICE BRAKE ADJUSTMENT**WARNING**

When the semitrailer has performed heavy braking, the brake drums may be hot to the touch. Use caution and **DO NOT** come into contact with the brake drum when checking for heat. Allow the brake drum to cool before performing maintenance. Failure to follow this warning may result in injury to personnel.

CAUTION

Brake adjustments are mandatory after installing new brakes or performing maintenance on the brakes. Brake adjustments must also be accomplished if any of the following conditions exist:

- The slack adjusters are not level with each other when the brakes are applied.
- The brake chamber clevis moves more than 2 in. (5.1 cm) from fully released condition to fully engaged condition (WP 0035).

NOTE

- Regardless of the position of the tractor's TRAILER AIR SUPPLY valve knob, the tractor will NOT be able to supply air to the semitrailer's air tanks if the tractor's PARKING BRAKE knob is pulled out (parking brakes set).
- Brake adjustments must be done after the suspension assembly has been completely reassembled and air pressure has been restored to the system or an improper adjustment may be made.

1. Chock wheels on both tractor and semitrailer. Inside cab of tractor, push in black knob for PARKING BRAKE and red knob for TRAILER AIR SUPPLY (TM 9-2320-360-10).

CAUTION

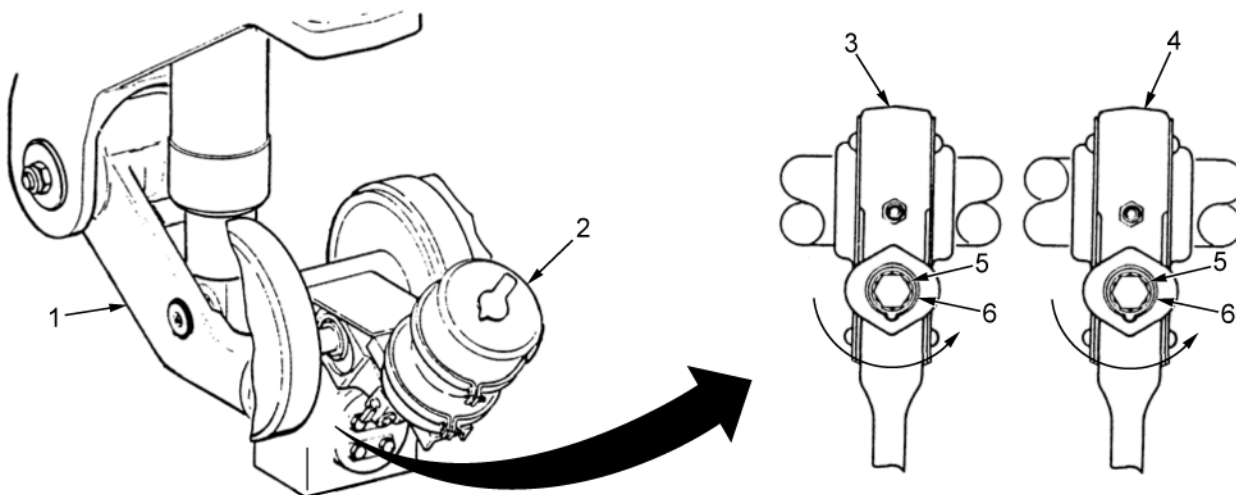
Brake adjustments require that the semitrailer air tanks be fully charged to ensure that each brake chamber push rod is fully retracted. With less than a fully charged system, the brakes may release, but not fully retract, giving a false indication of the caged position. If the brakes are not fully retracted, proper brake adjustment cannot be completed.

2. Allow tractor air system pressure gauge to reach 100 psi (689.5 kPa) (TM 9-2320-360-10). Wait an additional 10 minutes to ensure semitrailer air system is fully charged and all brake chamber push rods are fully retracted.
3. Locate left-hand slack adjuster (Figure 1, Item 3), right-hand slack adjuster (Figure 1, Item 4), and parking/service brake chamber (Figure 1, Item 2) on affected suspension assembly (Figure 1, Item 1).

CAUTION

Ensure each locking ring moves freely in and out prior to adjusting the slack adjuster or damage to equipment may result.

4. Press in on locking ring (Figure 1, Item 6) on left-hand slack adjuster (Figure 1, Item 3). Using moderate force, turn adjusting nut (Figure 1, Item 5) counterclockwise as far as possible.
5. Press in on locking ring (Figure 1, Item 6) on right-hand slack adjuster (Figure 1, Item 4). Using moderate force, turn adjusting nut (Figure 1, Item 5) counterclockwise as far as possible.
6. Repeat steps 4 and 5 until adjusting nuts (Figure 1, Item 5) on both left-hand and right-hand slack adjusters (Figure 1, Item 3 and Item 4) cannot be turned counterclockwise any further. This ensures that both sets of brake shoes are firmly in contact with each brake drum.



HETT0228

Figure 1. Slack Adjusters.

7. Ensure left-hand and right-hand slack adjusters (Figure 2, Item 1 and Item 2) are approximately parallel to each other, and mending plate (Figure 2, Item 5) is approximately parallel to the ground.
8. If slack adjusters (Figure 2, Item 1 and Item 2) are parallel to each other, and mending plate (Figure 2, Item 5) is parallel to the ground, proceed to step 9. If slack adjusters are not parallel to each other or mending plate is not parallel to the ground, proceed as follows:
 - a. On highest slack adjuster (Figure 2, Item 1 and Item 2), press in on locking ring (Figure 2, Item 3) and turn adjusting nut (Figure 2, Item 4) clockwise until highest slack adjuster is only slightly higher than other slack adjuster.
 - b. On lowest slack adjuster (Figure 2, Item 1 and Item 2), press in on locking ring (Figure 2, Item 3) and turn adjusting nut (Figure 2, Item 4) counterclockwise until brake shoes are firmly against brake drum.
 - c. On highest slack adjuster (Figure 2, Item 1 and Item 2), press in on locking ring (Figure 2, Item 3) and turn adjusting nut (Figure 2, Item 4) counterclockwise until brake shoes are firmly against brake drum.
 - d. Repeat steps a, b, and c until both sets of brake shoes are firmly against brake drums, and mending plate (Figure 2, Item 5) is approximately parallel to the ground.

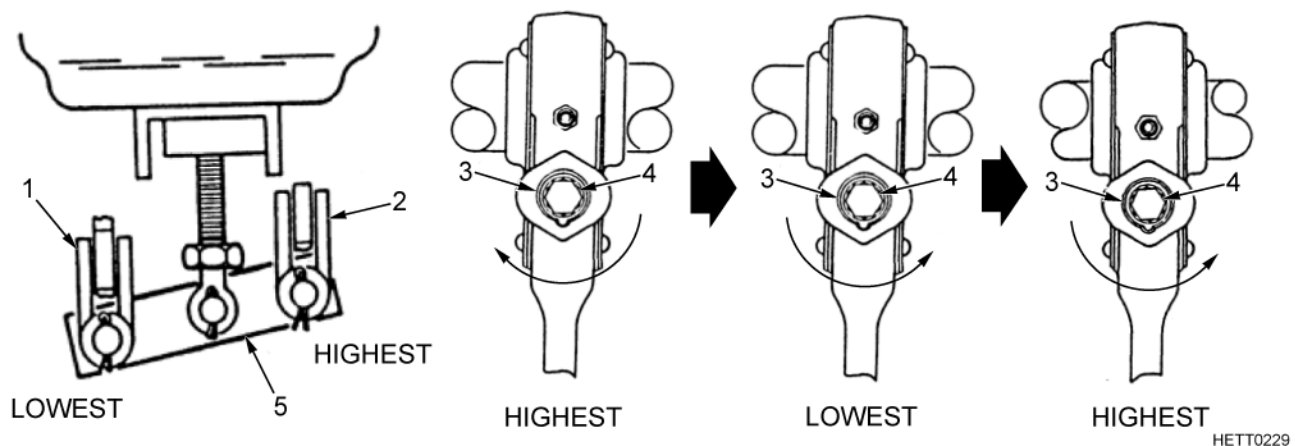
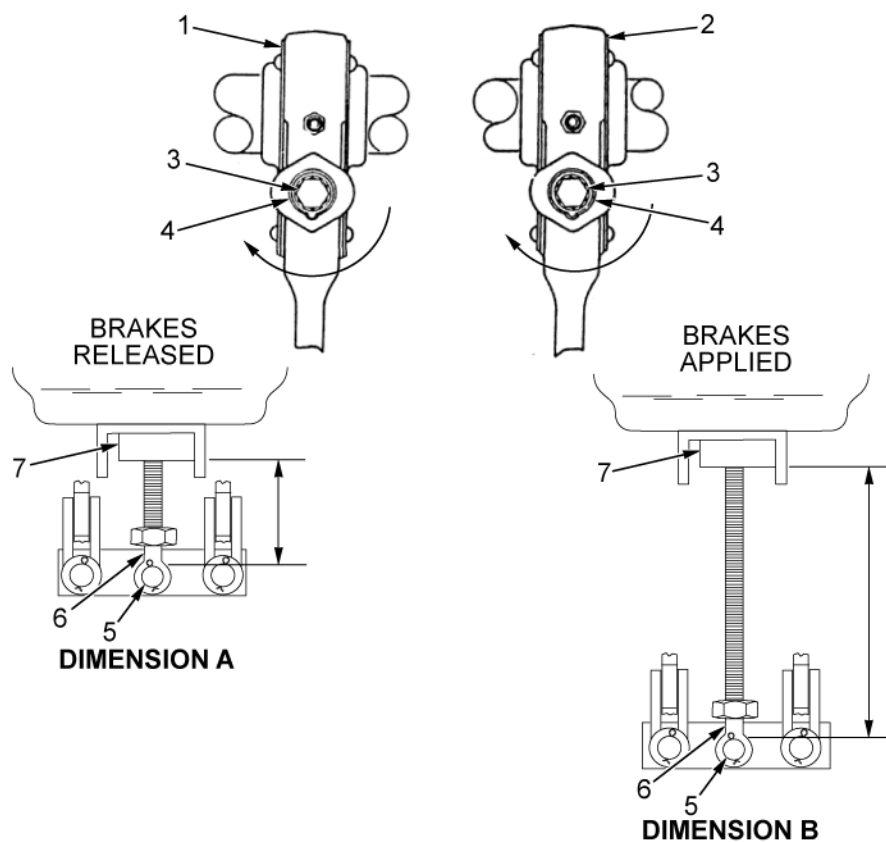


Figure 2. Slack Adjusters.

9. Press in on locking ring (Figure 3, Item 4) and turn adjusting nut (Figure 3, Item 3) on both slack adjusters (Figure 3, Item 1 and Item 2) one quarter turn clockwise. Brake shoes are now just clear of brake drums.
10. Measure distance from bottom of brake chamber bracket (Figure 3, Item 7) to top of straight headless pin (Figure 3, Item 5) on clevis (Figure 3, Item 6) (Dimension A). Document measurement.
11. Apply semitrailer parking brakes by pulling out on knob of brake release valve (WP 0004).
12. Measure distance from bottom of brake chamber bracket (Figure 3, Item 7) to top of straight headless pin (Figure 3, Item 5) on clevis (Figure 3, Item 6) (Dimension B). Document measurement.
13. If difference between two measurements taken is less than 1 in. (2.5 cm) and both slack adjusters (Figure 3, Item 1 and Item 2) are still approximately parallel to each other and the ground, brake adjustment is complete. If not, repeat steps 4 through 12, as required.
14. After all adjustments have been completed, verify that locking ring (Figure 3, Item 4) on each slack adjuster (Figure 3, Item 1 and Item 2) is popped outward to lock adjusting nut (Figure 3, Item 3). Rotate adjusting nut on either slack adjuster counterclockwise until each locking ring has positively locked each adjusting nut, as required.



HETT0230

Figure 3. Slack Adjusters.

END OF TASK**FOLLOW-ON MAINTENANCE**

Operate and/or drive tractor/semitrailer to check for proper brake operation (WP 0014).

END OF WORK PACKAGE

FIELD MAINTENANCE
PLATFORM STEERING ALIGNMENT

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMKT) (WP 0168, Item 11) WP 0014
Standard Army Tool Kit (SATS)
(WP 0168, Item 28)

Personnel Required

2

References

WP 0004
WP 0010

Equipment Conditions

Tractor/semitrailer coupled and tractor parking brakes
applied (WP 0013)
Platform adjusted to 43 in. (127 cm) height (WP 0008)
Front support legs lowered supporting platform (WP 0011)
Rear support legs lowered supporting platform (WP 0012)

GENERAL INFORMATION

This work package contains platform steering alignment instructions for the Heavy Equipment Transporter (HET) semitrailer.

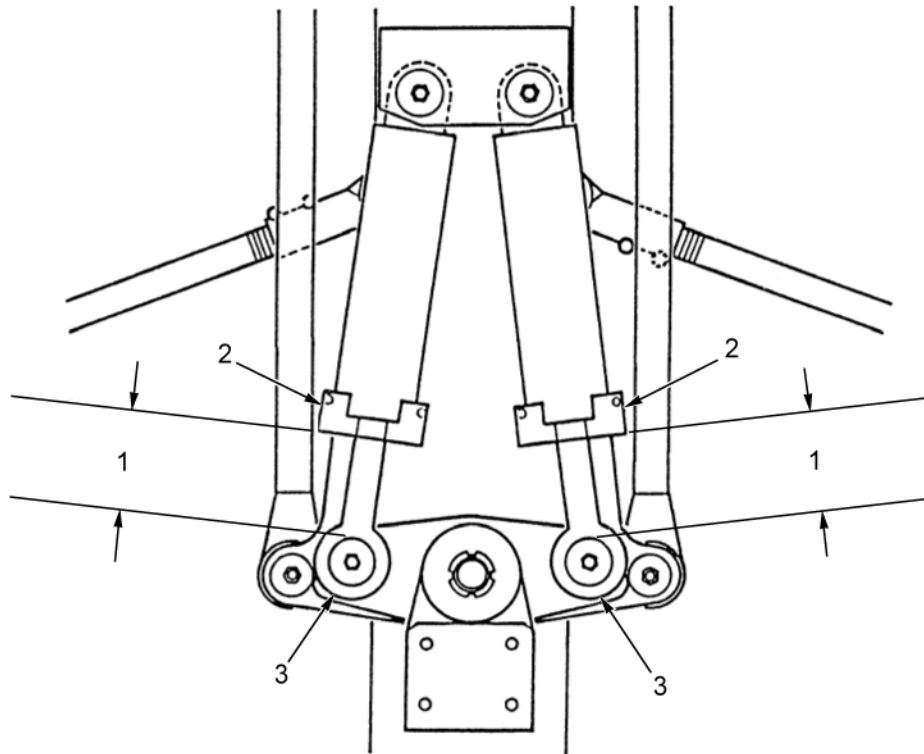
PLATFORM STEERING ALIGNMENT

1. Release semitrailer parking brakes by pushing inward on knob of parking brake valve (WP 0004).

NOTE

Steering stop blocks and associated hardware are not used on vehicles with manufacturer's serial numbers 526 and subsequent numbers. The manufacturer's serial number is stamped in front of the platform's main beam under the gooseneck.

2. Document measurements of dimensions (Figure 1, Item 1) at both steering plate cylinder mounts (Figure 1, Item 3) to both steering cylinder (Figure 1, Item 2) stops or to ends of cylinders. Compare measurements.
3. If necessary, manually steer semitrailer (WP 0010) and recheck measurement. Steer bogies, as required, until both measurements are the same, within 0.125 in. (0.3 cm).



HETT0231

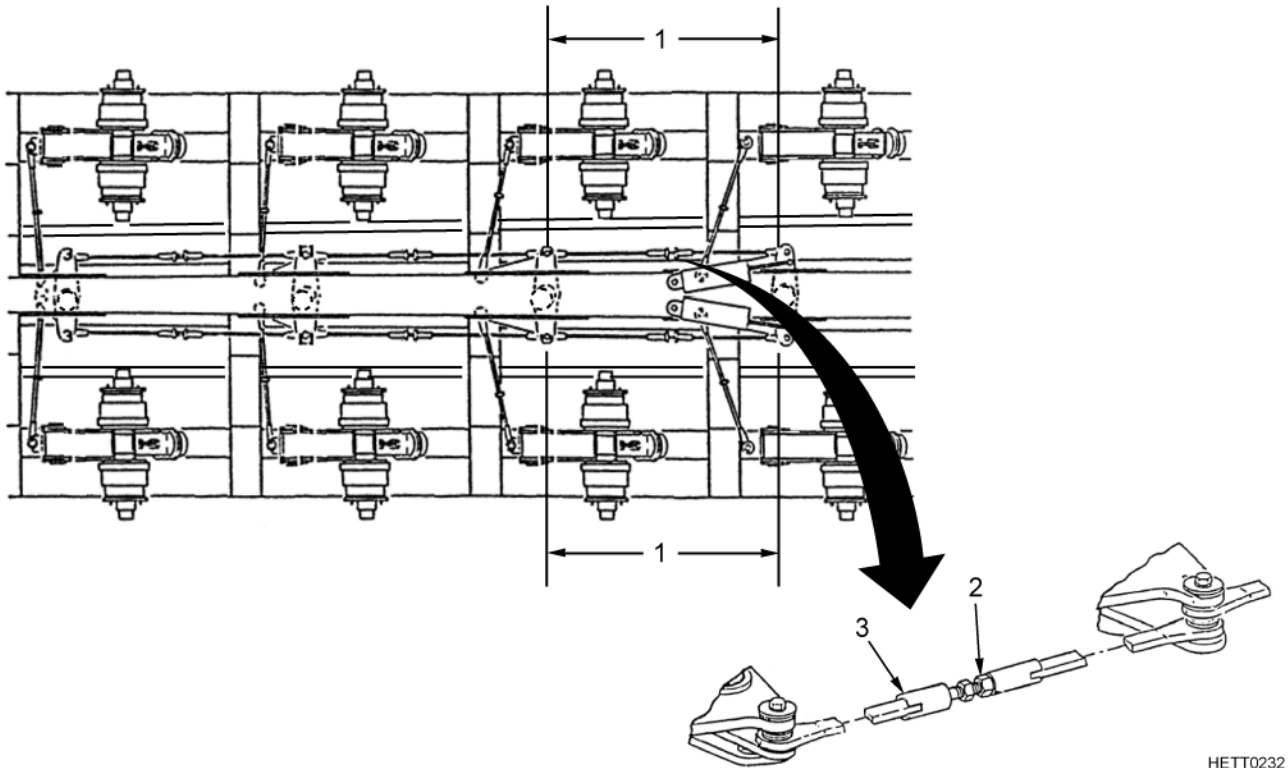
Figure 1. Steering Cylinders.

4. Document measurements of dimensions (Figure 2, Item 1) of both streetside and curbside longitudinal struts No. 3 (Figure 2, Item 3).

CAUTION

Before adjusting any of the longitudinal struts, the slack must be removed first. While adjusting the longitudinal struts, the tension must be maintained or a proper alignment will not be achieved.

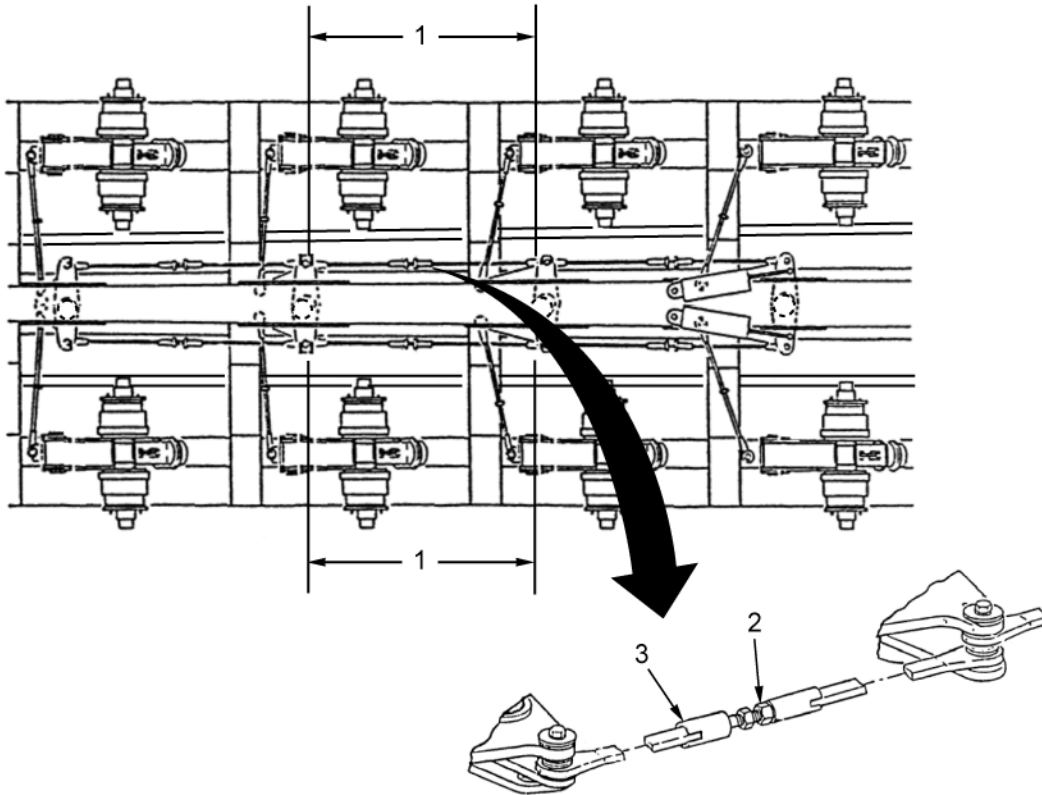
5. Using adjustable automotive wrench, loosen two locknuts (Figure 2, Item 2) and adjust both longitudinal struts No. 3 (Figure 2, Item 3) until struts are same length, within 0.125 in. (0.3 cm). Retighten locknuts.



HETT0232

Figure 2. Longitudinal Struts No. 3.

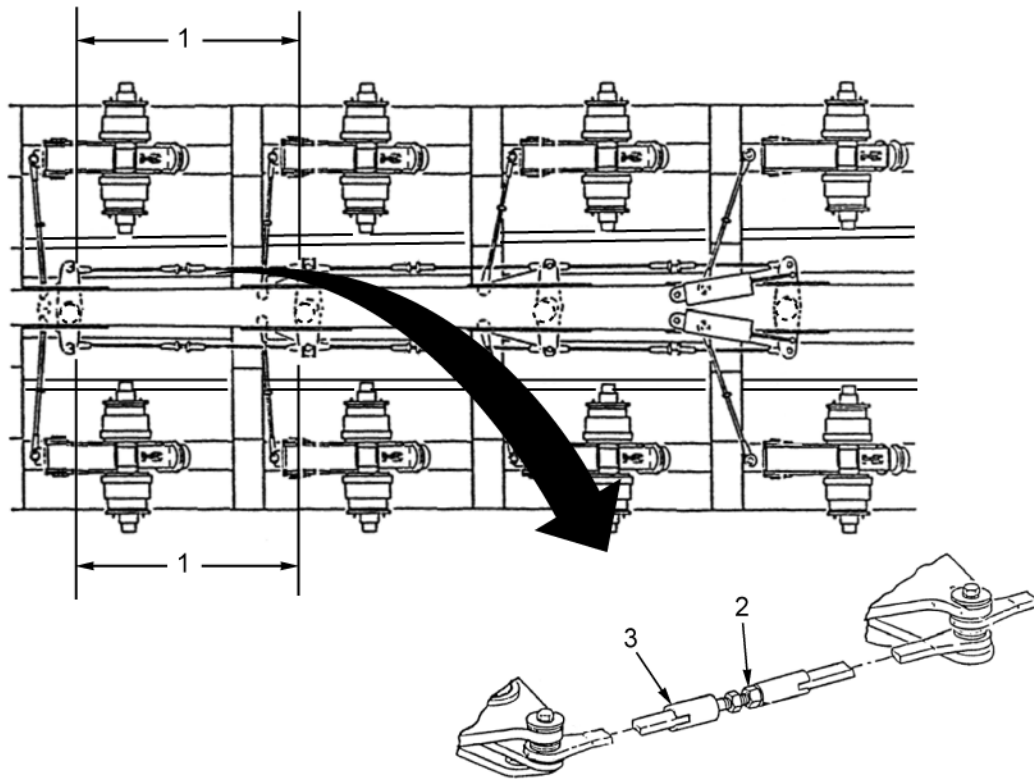
6. Document measurements of dimensions (Figure 3, Item 1) of both streetside and curbside longitudinal struts No. 2 (Figure 3, Item 3).
7. Using adjustable automotive wrench, loosen two locknuts (Figure 3, Item 2) and adjust both longitudinal struts No. 2 (Figure 3, Item 3) until struts are same length, within 0.125 in. (0.3 cm). Retighten locknuts.



HETT0893

Figure 3. Longitudinal Struts No. 2.

8. Document measurements of dimensions (Figure 4, Item 1) of both streetside and curbside longitudinal struts No. 1 (Figure 4, Item 3).
9. Using adjustable automotive wrench, loosen two locknuts (Figure 4, Item 2) and adjust both longitudinal struts No. 1 (Figure 4, Item 3) until struts are same length, within 0.125 in. (0.3 cm). Retighten locknuts.



HETT0894

Figure 4. Longitudinal Struts No. 1.

NOTE

Both nonsteering bogies must be aligned prior to aligning the remaining steerable bogies. The measurement must be taken from the rim of each nonsteering bogie's inner/outer wheel to the longitudinal beam.

10. Document measurements of dimensions (Figure 5, Item 1, Item 3, Item 7, and Item 8) from foremost and rearmost points on each inner/outer rim for both No. 1 (nonsteering) bogies (Figure 5, Item 4) to longitudinal beam (Figure 5, Item 2).
11. If necessary, loosen two bolts (Figure 5, Item 5) on each fixed connecting link (Figure 5, Item 6). Using an adjustable automotive wrench, adjust connecting link so that streetside dimensions (Figure 5, Item 1 and Item 8) are equal and curbside dimensions (Figure 5, Item 3 and Item 7) are equal.
12. Recheck measurements and document results. Once measurement is even for each rim, retighten two bolts (Figure 5, Item 5) on each connecting link (Figure 5, Item 6).
13. Repeat steps 10 through 12 for both curbside and streetside bogies No. 2 through No. 5.
14. Apply semitrailer parking brakes by pulling out knob of parking brake valve (WP 0004).

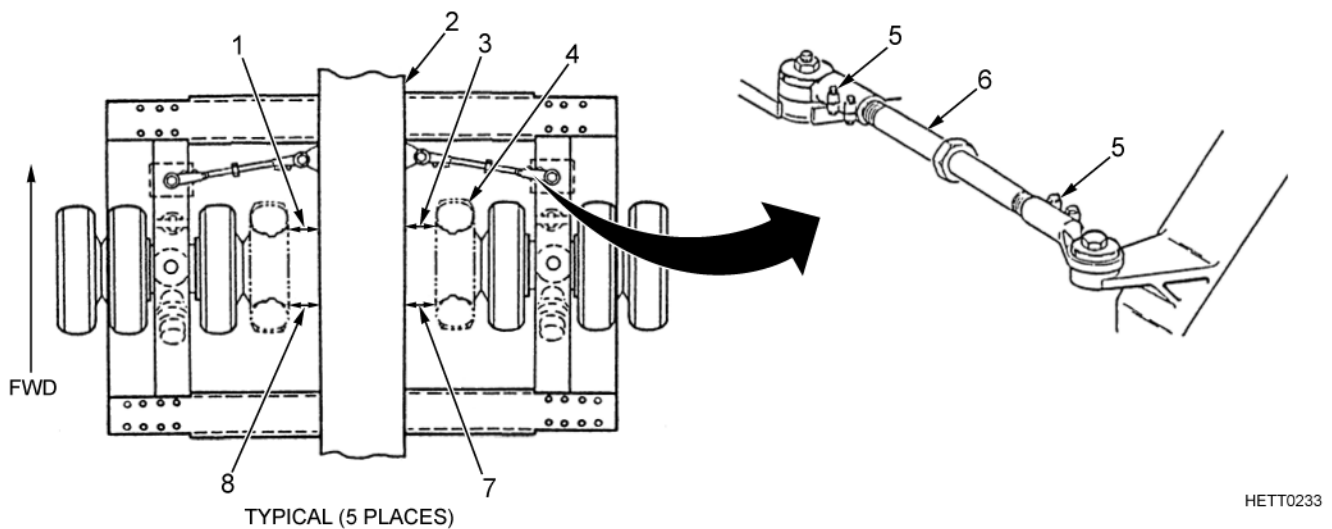


Figure 5. Connecting Links.

END OF TASK**FOLLOW-ON MAINTENANCE**

Drive tractor/semitrailer and check semitrailer tracking (WP 0014).

END OF WORK PACKAGE

FIELD MAINTENANCE

HYDRAULIC SYSTEM CHECK AND FLUID FILL

INITIAL SETUP:

Tools and Special Tools

- General Mechanic’s Tool Kit (WP 0168, Item 11)
- Standard Army Tool Set (SATS) (WP 0168, Item 28)

- WP 0008
- WP 0013
- WP 0014
- WP 0030
- WP 0041

Materials/Parts

- Cap and Plug Set (WP 0170, Item 4)
- Hydraulic Fluid (WP 0170, Item 17)

Equipment Conditions

- Tractor coupled to semitrailer or gooseneck supported (WP 0013)
- Auxiliary Power Unit (APU) running (WP 0005)

Personnel Required

2

References

- WP 0005

GENERAL INFORMATION

This work package provides instructions for the system check and the fluid fill of the Heavy Equipment Transporter (HET) semitrailer.

HYDRAULIC SYSTEM CHECK AND FLUID FILL

System Check

WARNING



- Hydraulic fluid may be hot if the system has been in operation. Allow the system to cool before performing maintenance.
- Hydraulic fluid may be under pressure. Use caution when disconnecting the hydraulic components.
- Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into the eyes, flush them immediately with water and seek medical attention. If hydraulic fluid gets on skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking.

Failure to follow these warnings may result in injury to personnel.

NOTE

Perform steps 1 through 4 to check the hydraulic fluid level.

1. Park tractor/semitrailer on level ground with no side slopes (WP 0013).
2. Check platform height (WP 0008). Platform should be at normal road height of 43 in. (109 cm), and gooseneck should be approximately 63 in. (160 cm).
3. Shut down Auxiliary Power Unit (APU) (WP 0005).

NOTE

Fluid levels measure differently at different times due to hydraulic fluid temperature, air in the system, or unlevel ground surface.

4. Check fluid level in hydraulic tank (Figure 1, Item 1). Fluid in indicator tube (Figure 1, Item 2) should measure within FULL mark range on hydraulic tank decal (Figure 1, Item 3). If fluid level is above top line of FULL mark, system is overfilled.
5. First check for proper gooseneck and platform heights (WP 0008). Readjust height if semitrailer is not properly adjusted.

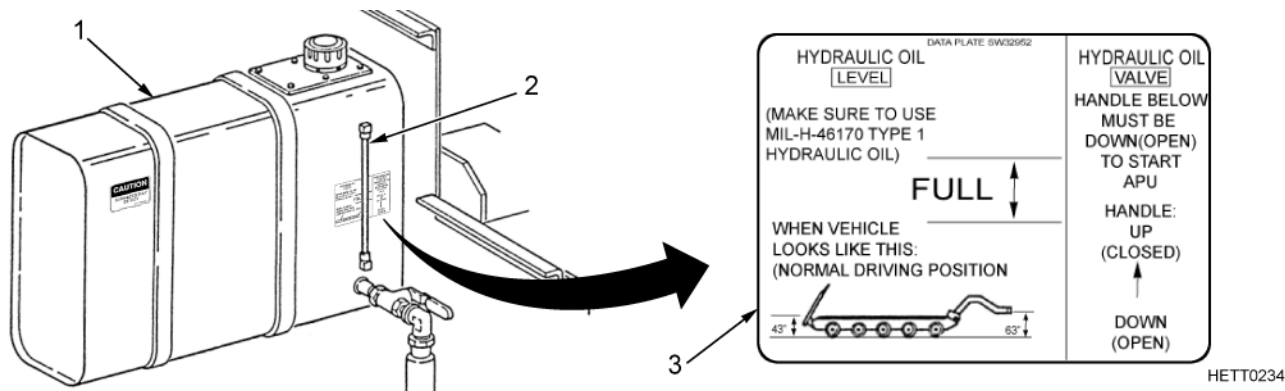


Figure 1. Fluid Level.

NOTE

If the fluid level is more than 1 in. (2.54 cm) over the top line of the FULL mark, perform steps 6 through 7.

6. Operate semitrailer (WP 0014) and check for sluggish or slow operation that may be caused by air trapped in hydraulic system.
7. Bleed hydraulic system (WP 0041) if improper operations are found.
8. If all operations are normal and hydraulic fluid level is still high, proceed to step 9.

WARNING

On some semitrailers, a solar battery charger is mounted to the top of the gooseneck directly in front of the spare tires. Persons working on top of the gooseneck must take EXTREME care not to step on or trip over the solar battery charger. Failure to follow this warning may result in injury to personnel.

NOTE

One person should monitor the fluid level indicator while on top of the gooseneck while the other person drains the fluid from the rear of the hydraulic control panel.

9. With aid of an assistant, drain fluid from hydraulic tank (Figure 2, Item 1) by loosening hose fitting (Figure 2, Item 3) at rear of hydraulic control module (Figure 2, Item 2).
10. Allow fluid to drain from hydraulic tank (Figure 2, Item 1) into drain pan until fluid level is approximately in middle of FULL mark.
11. Tighten hose fitting (Figure 2, Item 3).
12. If too much hydraulic fluid was drained, refill tank to proper level per FLUID FILL procedure on following page.

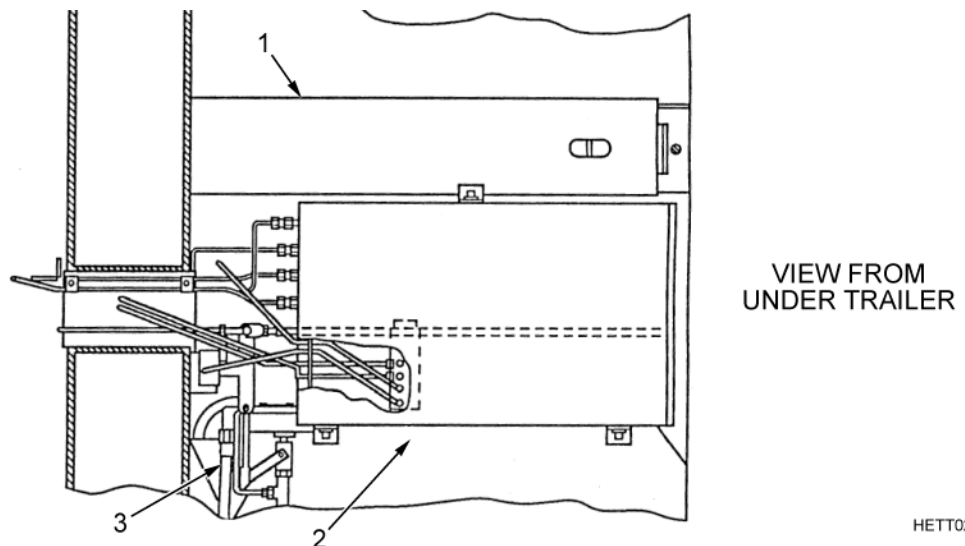


Figure 2. Fluid Drain.

END OF TASK

Fluid Fill

1. Park tractor/semitrailer on level ground with no side slopes (WP 0013).
2. Check platform height (WP 0008). Platform should be at normal road height of 43 in. (109 cm), and gooseneck should be approximately 63 in. (160 cm).
3. Shut down APU (WP 0005).

WARNING

On some semitrailers, a solar battery charger is mounted to the top of the gooseneck directly in front of the spare tires. Persons working on top of the gooseneck must take EXTREME care not to step on or trip over the solar battery charger. Failure to follow this warning may result in injury to personnel.

CAUTION

If the fluid level is more than 1 in. (2.54 cm) below the bottom of the FULL mark, then fluid must be added before operating the APU or damage to equipment may result.

NOTE

If more than 1 in. (2.54 cm) of fluid must be added, check the entire hydraulic system for leaks, and service the system as required.

4. Unhook latch (Figure 3, Item 1) and raise top step (Figure 3, Item 2) to gain access to hydraulic tank (Figure 3, Item 3).
5. Remove dirt from hydraulic tank breather cap (Figure 3, Item 4) and from top of hydraulic tank (Figure 3, Item 3).

NOTE

DO NOT let foreign material enter the hydraulic tank or touch the bottom of the breather cap.

6. Remove breather cap (Figure 3, Item 4). Minimize time breather cap is off of hydraulic tank (Figure 3, Item 3) and replace cap immediately after filling is complete.

NOTE

Monitor the fluid level while filling the tank to prevent overfilling.

7. Use new/clean hydraulic fluid to fill tank until fluid in sight indicator (Figure 3, Item 5) reaches approximately center of FULL mark.
8. Install breather cap (Figure 3, Item 4) to hydraulic tank (Figure 3, Item 3).
9. Lower step (Figure 3, Item 2) and secure by hooking latch (Figure 3, Item 1) to step.

CAUTION

If fluid was added due to damage or repair, the hydraulic system must be bled. Recheck the fluid level prior to operating any hydraulic controls or damage to equipment may result.

10. If loss of hydraulic fluid was caused by damage or a repair, air may have entered hydraulic system. Refer to WP 0041 and bleed the affected hydraulic system.
11. If no repairs were made and more than 3 in. (7.6 cm) of fluid was added, or if fluid has been added daily, refer to Troubleshooting (WP 0030) to determine the source of the leak.

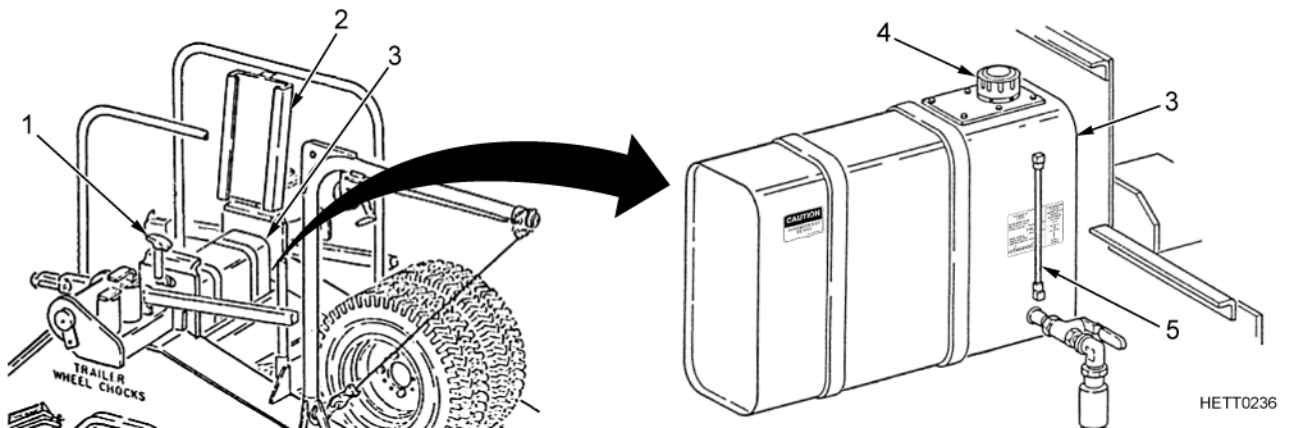


Figure 3. Fluid Fill.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
HYDRAULIC TANK DRAINING

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0168, Item 11)

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Pipe sealant (WP 0170, Item 22)
Hydraulic Fluid (WP 0170, Item 17)
Identification Tags (WP 0170, Item xx)

Personnel Required

2

References

WP 0039
WP 0041

Equipment Conditions

Gooseneck set at coupling height, 64 in. (163 cm)
(WP 0007)
Front support legs lowered supporting platform (WP 0011)
Rear support legs lowered supporting platform (WP 0012)
Platform lowered onto, and firmly supported by, support
legs (WP 0008)

GENERAL INFORMATION

This work package contains instructions for draining the hydraulic tank of the heavy Equipment Transporter (HET) semitrailer.

HYDRAULIC TANK DRAINING**WARNING**

On some semitrailers, a solar battery charger is mounted to the top of the gooseneck directly in front of the spare tires. Persons working on top of the gooseneck must take **EXTREME** care not to step on or trip over the solar battery charger. Failure to follow this warning may result in injury to personnel.

WARNING

- The hydraulic fluid may be hot if the system has been in operation. Allow the system to cool before performing maintenance.
- The hydraulic fluid may be under pressure. Use caution when disconnecting the hydraulic components.
- Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into the eyes, flush them immediately with water and seek medical attention. If hydraulic fluid gets on skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking.

Failure to follow these warnings may result in injury to personnel.

CAUTION

Throughout this procedure, all fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or foreign material from entering the hydraulic system, or damage to equipment may result.

NOTE

The hydraulic tank has a capacity of 16.5 gal. (62.5 l). With the platform at road height and the gooseneck at coupling height, the hydraulic tank should contain approximately 8 gal. (30 l) of hydraulic fluid.

1. At rear of gooseneck (Figure 1, Item 1), access top of hydraulic tank (Figure 1, Item 3) by unhooking step retainer (Figure 1, Item 2) and raising top step (Figure 1, Item 4) toward streetside of gooseneck.

2. While holding top step (Figure 1, Item 4) upright, unscrew and remove breather cap (Figure 1, Item 5) from hydraulic tank (Figure 1, Item 3). Lower top step onto gooseneck (Figure 1, Item 1).

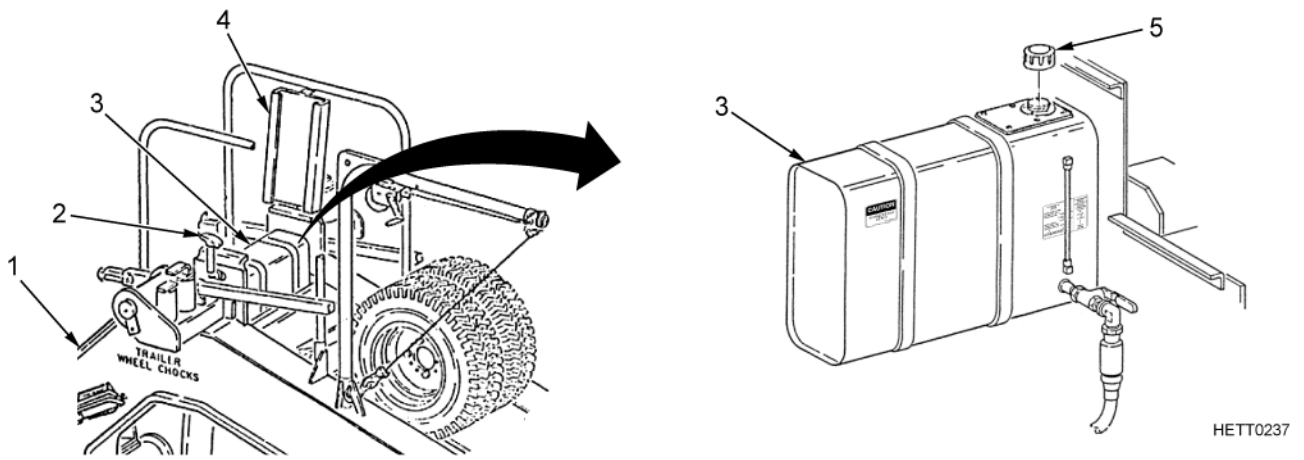


Figure 1. Breather Cap.

3. Unhook step retainer (Figure 2, Item 3) and pull upward on step section (Figure 2, Item 5). Continue to push step section until step section contacts top step (Figure 2, Item 2).
4. Secure step section (Figure 2, Item 1) in upright position by attaching step retainer (Figure 2, Item 1) to metal strap (Figure 2, Item 1) on step section.

NOTE

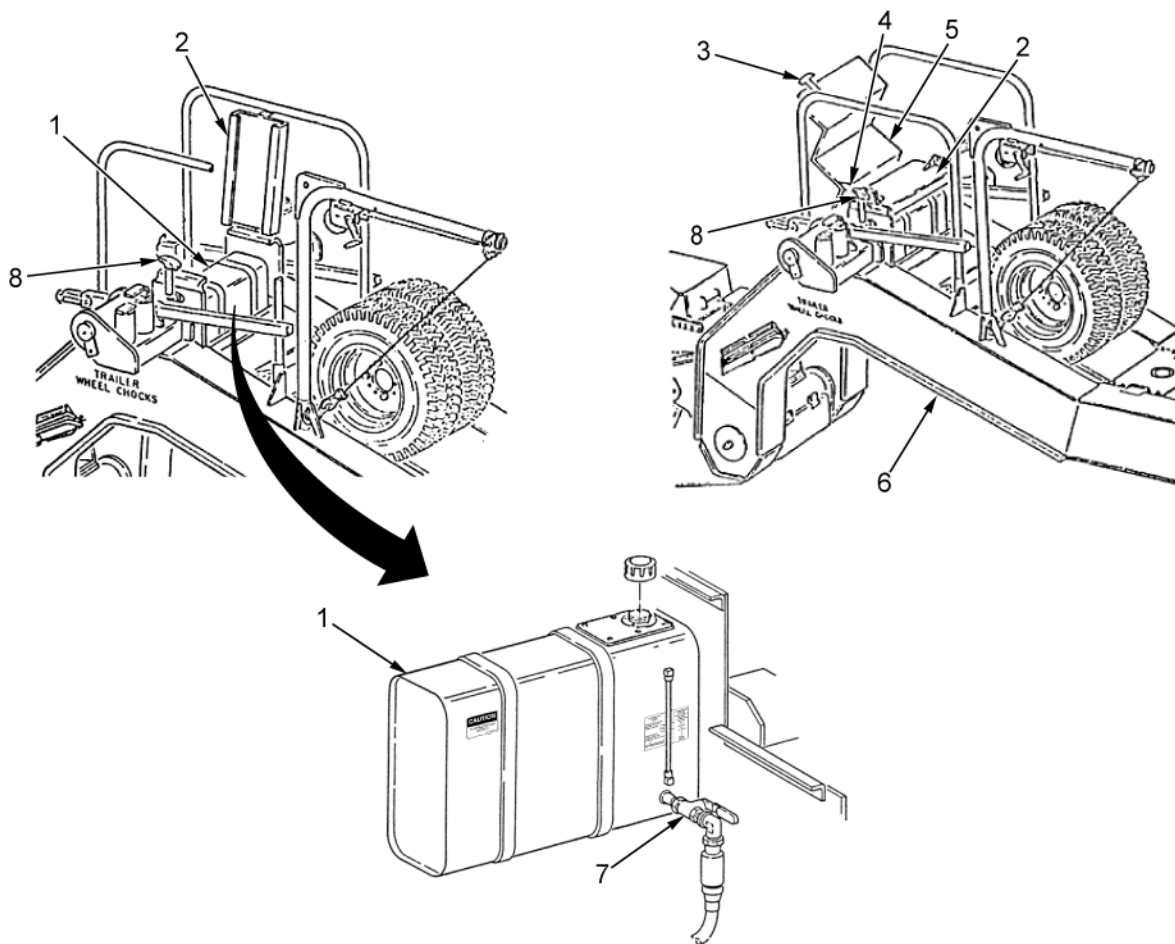
The oil valve handle is shown in the OPEN position.

5. Pull handle of oil valve (Figure 2, Item 8) on hydraulic tank (Figure 2, Item 1) to close valve. Valve handle should appear vertical to valve body of oil valve when in CLOSED position.

NOTE

The General Mechanic's Tool Kit (GMTK) rolling tool cabinet should be placed directly beneath the hydraulic tank oil valve under the gooseneck. This provides bench space on which to place the drain pan during this task.

6. Roll GMTK tool cabinet under gooseneck (Figure 2, Item 6) below oil valve (Figure 2, Item 8). Place drain pan with opening in pan under oil valve.



HETT0915

Figure 2. Oil Valve Handle.

7. With assistant under gooseneck and using two wrenches, tag and disconnect hydraulic hose (Figure 3, Item 3) from straight adapter (Figure 3, Item 4). Allow all fluid in hose to drain into drain pan. Install caps/plugs into all openings.

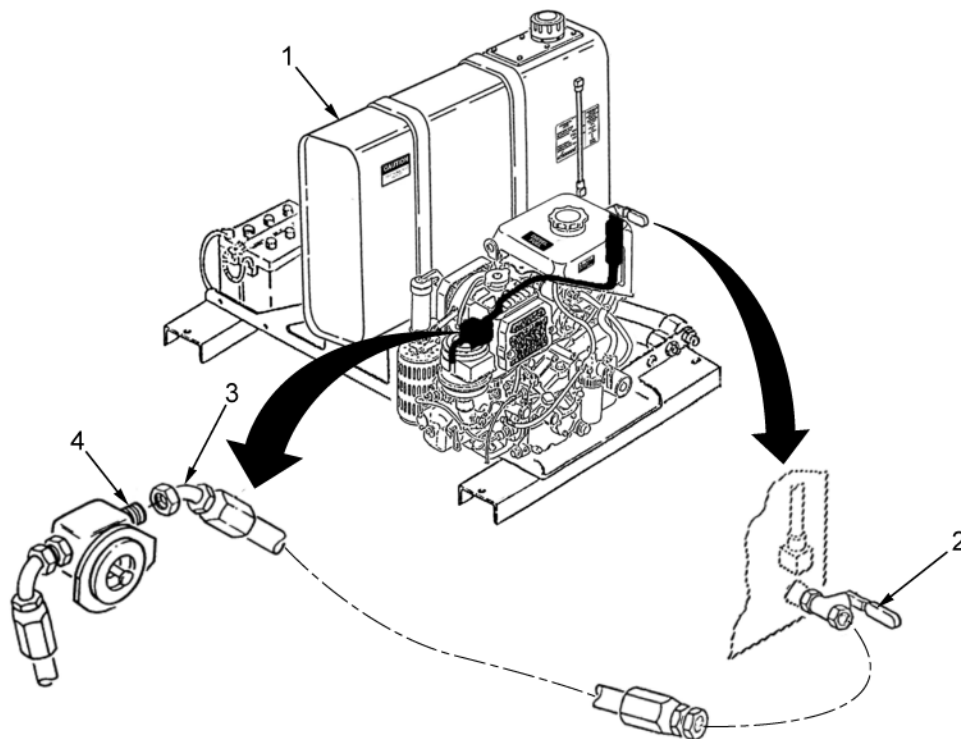
WARNING

On some semitrailers, a solar battery charger is mounted to the top of the gooseneck directly in front of the spare tires. Persons working on top of the gooseneck must take **EXTREME care not to step on or trip over the solar battery charger. Failure to follow this warning may result in injury to personnel.**

NOTE

The steps 8 through 14 require two people to drain hydraulic fluid from the hydraulic tank. One person positioned on the gooseneck at the hydraulic tank oil valve and the second person positioned under the gooseneck at the drain pan.

8. Remove cap/plug from hydraulic hose (Figure 3, Item 3) and insert end of hose into opening in drain pan.
9. Signal person on gooseneck to OPEN oil valve (Figure 3, Item 2) moving valve handle in line with valve body and allow fluid to drain from hydraulic tank (Figure 3, Item 1).
10. Continually monitor fluid level in drain pan and, when drain pan is approximately full, signal person on gooseneck to CLOSE oil valve (Figure 3, Item 2). Install caps/plugs into hose.
11. Dispose of hydraulic fluid in accordance with standard shop practices.
12. Position drain pan on tool cabinet with opening in drain pan under oil valve (Figure 3, Item 2).
13. Repeat steps 8 through 12 as required until all fluid that can be drained from this hose has been drained.
14. Remove caps/plugs installed and connect hydraulic hose (Figure 3, Item 3) to straight adapter (Figure 3, Item 4).



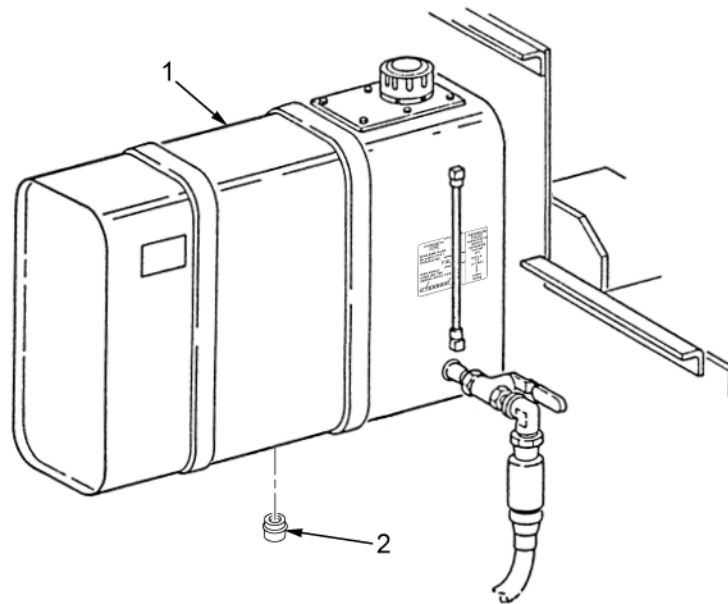
HETT0238

Figure 3. Drain Valve.

NOTE

- The hydraulic tank has been sufficiently drained for maintenance to be performed on the system. If fluid change is required due to contamination, proceed with step 15.
- Steps 15 through 21 require an assistant to empty the hydraulic tank.

15. Position rolling tool cabinet under semitrailer gooseneck so that cabinet is under Auxiliary Power Unit (APU) hydraulic pump.
16. Position opening in drain pan centered under drain plug (Figure 4, Item 2) on bottom of hydraulic tank (Figure 4, Item 1), located just aft of APU pump.
17. Move all hydraulic lines and electrical ground straps clear of fluid drain path.
18. With one person standing under gooseneck, remove drain plug (Figure 4, Item 2) from bottom of hydraulic tank (Figure 4, Item 1).
19. Allow all fluid in hydraulic tank (Figure 4, Item 1), approximately 0.5 to 1.0 gl (1.9 to 3.8 l) of fluid, to drain into drain pan.
20. Inspect drain plug (Figure 4, Item 2) for contaminants, metal particles, and corrosion. Clean drain plug with clean hydraulic fluid.
21. Apply pipe sealant to male threads of drain plug (Figure 4, Item 2) and install drain plug on hydraulic tank (Figure 4, Item 1).



HETT0239

Figure 4. Drain Plug.

END OF TASK**FOLLOW-ON MAINTENANCE**

Refill hydraulic tank as required (WP 0039).

Bleed hydraulic system as required (WP 0041).

END OF WORK PACKAGE

FIELD MAINTENANCE

HYDRAULIC SYSTEM BLEEDING

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (WP 0168, Item 11)

Personnel Required

3

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)

Pipe Sealant (WP 0170, Item 22)

Hose, Clear, 36 in. (91 cm) (2)

Equipment Conditions

Tractor/semitrailer coupled and parked on level ground (WP 0013)

Platform set at road height (WP 0008)

Auxiliary Power Unit (APU) shut down (WP 0005)

GENERAL INFORMATION

This work package contains instructions for steering circuit bleeding, suspension circuit bleeding, and gooseneck circuit bleeding.

GENERAL SAFETY INSTRUCTIONS

WARNING



- Hydraulic fluid may be hot if system has been in operation. Allow system to cool before performing maintenance.
- Hydraulic fluid may be under pressure. Use caution when disconnecting hydraulic components.
- Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into the eyes, flush them immediately with water and seek medical attention. If hydraulic fluid gets on skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking.

Failure to follow these warnings may result in injury to personnel.

CAUTION

- Throughout this procedure, all fittings and openings must be capped or plugged immediately after opening to prevent dirt and moisture or foreign material from entering the hydraulic system or damage to equipment may result.
- To avoid premature failure of hydraulic components or system failure, bleeding of the hydraulic system must be performed if one of the following conditions exists:
 - A system leak, failure, maintenance, or repair that has drained fluid from the system or allowed air to enter the system.
 - Any symptom occurs that would be caused by air in the system such as steering off tracking, suspension, or gooseneck drop.

NOTE

This bleed procedure can be done completely in the order listed. If a specific symptom or failure is isolated to one area, then this procedure can be done in parts. Complete the parts necessary to bleed the hydraulic system and remove all air.

STEERING CIRCUIT BLEEDING**WARNING**

Prior to bleeding steering cylinders, all four support legs must be lowered and support the platform. Failure to follow this warning may result in injury to personnel.

1. Lower both front and rear support legs (WP 0011 and WP 0012).
2. Release brakes on semitrailer by pushing inward on brake release valve (WP 0004).
3. Start Auxiliary Power Unit (APU) (WP 0005).
4. Operate semitrailer steering (WP 0010) full left, full right, and back to center.
5. Place drain pan (Figure 1, Item 3) under curbside gooseneck on steering cylinder (Figure 1, Item 2).
6. Attach a 36 in. (91 cm) tube (Figure 1, Item 4) to each bleed valve (Figure 1, Item 1). Point both tubes into drain pan (Figure 1, Item 3).
7. Slowly open both bleed valves (Figure 1, Item 1) on curbside gooseneck steering cylinder (Figure 1, Item 2).

WARNING

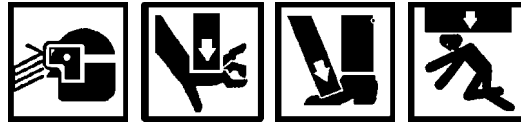
- **To avoid injury to personnel when bleeding gooseneck steering cylinders, use two personnel to perform these steps.**
- **One person is required to operate steering valve and a second person is required to check fluid/air flow out of the bleed tubes.**

Failure to follow these warnings may result in injury to personnel.

NOTE

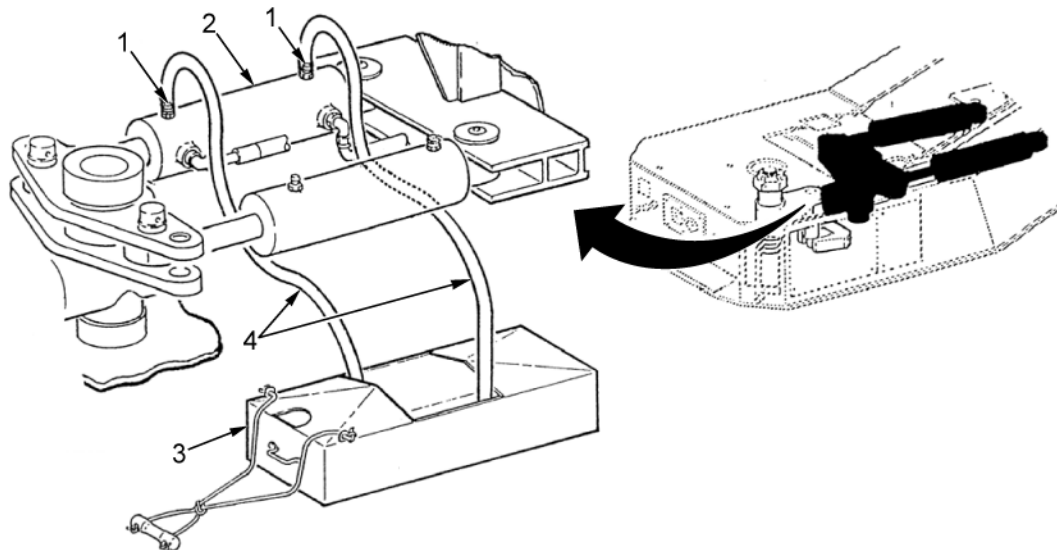
Apply only enough pressure on cylinders to force fluid/air out of cylinders. Do not allow steerable axles to move or too much pressure has been applied.

8. Slowly operate steering valve for a right turn. Use caution not to turn any of the steerable axles. Observe fluid/air flow out of one tube (Figure 1, Item 4). Continue to hold pressure on steering valve (WP 0004) until a steady stream of hydraulic fluid flows out of tube for approximately 10 seconds; then, close that bleed valve (Figure 1, Item 1). Release steering valve.
9. Slowly operate steering valve for a left turn. Use caution not to turn any of the steerable axles. Observe fluid/air flow out of other tube (Figure 1, Item 4). Continue to hold pressure on steering valve (WP 0004) until a steady stream of hydraulic fluid flows out of other tube for approximately 10 seconds; then, close that bleed valve (Figure 1, Item 1). Release steering valve.
10. Remove both tubes (Figure 1, Item 4) from bleed valves (Figure 1, Item 1).
11. Repeat steps 5 through 10 for bleeding streetside gooseneck steering cylinder.

WARNING

To avoid injury to personnel when bleeding platform steering cylinders, use three people to perform the following steps. One person is required to operate the steering valve, a second person is required to check fluid/air flow out of the bleed tubes, and a third person is required to relay signals between the other two. Failure to follow this warning may result in injury to personnel.

12. Repeat steps 5 through 10 for bleeding curbside platform steering cylinder.
13. Repeat steps 5 through 10 for bleeding streetside platform steering cylinder.
14. Shut down APU (WP 0005) and check fluid level in hydraulic tank (WP 0041). Refill tank as necessary.
15. Release semitrailer brakes. Start APU (WP 0005). Turn on tractor clearance lights and manually steer full left and full right several times and return steering to center. Steering pressure indicator light should not be lit.
16. If steering pressure indicator light is lit, re-bleed steering hydraulic system.



HETT0240

Figure 1. Bleed Valves, Curbside.

END OF TASK

SUSPENSION CIRCUIT BLEEDING

1. Start APU (WP 0005).

CAUTION

When lowering platform, do not allow suspension cylinders to be completely compressed or bottomed out. Allow a minimum of 1 in. (2.5 cm) of cylinder plunger/piston rod to remain exposed or damage to equipment may result.

2. Operate all three suspension controls (WP 0008) and lower suspension to approximately 1 in. (2.5 cm) from being fully lowered. Deck height should be approximately 34 in. (86 cm).
3. Raise platform (WP 0008) to approximately 52 in. (132 cm). This is approximately 1 in. (2.5 cm) less than its maximum height.
4. Repeat steps 2 and 3 until platform operates smoothly (approximately 30 cycles).

NOTE

If tactical situations permit, allow semitrailer to sit undisturbed for 8 hours or overnight as outlined in step 5. If not, skip step 5 and continue with step 7.

5. If semitrailer is allowed to sit undisturbed for 8 hours, continue as follows:
 - a. Evenly raise platform to a height of 52 in. (132 cm).
 - b. Shut down APU (WP 0005).
 - c. Allow trailer to sit for 8 hours or overnight.
 - d. If semitrailer has not settled, proceed to step 6. If semitrailer has settled, proceed to step e.
 - e. Start APU (WP 0005).
 - f. Repeat steps 2 and 3 approximately 15 cycles.
 - g. Repeat step 5.
6. Lower platform to normal road height (WP 0008) and shut down APU (WP 0005).
7. Perform gooseneck circuit bleeding.
8. Check hydraulic tank fluid level (WP 0039). Refill tank if necessary.

END OF TASK

GOOSENECK CIRCUIT BLEEDING

1. Uncouple tractor/semitrailer (WP 0013) and pull tractor out and away from gooseneck. Keep APU running after uncoupling. Leave gooseneck isolation valve pulled out in ADJUST position.
2. Lower front support legs to the ground (WP 0011) to support platform.
3. Operate gooseneck valve and lower gooseneck to lowest position (WP 0007).
4. Operate gooseneck valve and raise gooseneck to highest position (WP 0007).
5. Repeat steps 3 and 4 until gooseneck works smoothly (approximately 15 cycles).
6. Lower gooseneck to approximately 63 in. (160 cm) and couple tractor/semitrailer (WP 0013).
7. Raise front support legs (WP 0011).
8. Adjust platform to normal road height (WP 0008).
9. Shut down APU (WP 0005) and check fluid level in hydraulic tank (WP 0039). Refill tank, if necessary, to complete bleeding procedure.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

HYDRAULIC SYSTEM FLUSHING

INITIAL SETUP:**Tools and Special Tools**

Flushing Hose Kit (WP 0164, Fig. F-8)
General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)
Waste Oil Receptacle

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Hydraulic Fluid, 10 gal. (WP 0170, Item 17)
Rag, Wiping, Lint Free (WP 0170, Item 23)
Solvent, Dry Cleaning (WP 0170, Item 32)
Strap, Tiedown, Electrical (WP 0170, Item 33)
Gasket (1)

Personnel Required

2

Equipment Conditions

Front support legs lowered to first opening past stow position (WP 0011)
Front of platform lowered onto front support legs; rear of platform lowered as far as possible (WP 0008); rear support legs lowered (WP 0012)
Gooseneck raised to highest position and supported (WP 0007)
Top step and first upper stair section (for accessing Auxiliary Power Unit (APU) area) removed from gooseneck (WP 0086)
Semitrailer parking brakes set (brake release valve pulled out) (WP 0004)
Flushing Hose Kit obtained from field maintenance (WP 0164)
Hydraulic system filter (WP 0120)

GENERAL INFORMATION

This work package contains instructions for preparation, hydraulic tank flushing, suspension system flushing, steering system flushing, gooseneck cylinder flushing, steering cylinder flushing, and restoration for the hydraulic system.

PREPARATION**WARNING**

- Hydraulic fluid may be hot if system has been in operation. Allow system to cool before performing maintenance.
- Hydraulic fluid may be under pressure. Use caution when disconnecting hydraulic components.
- Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into the eyes, flush them immediately with water and seek medical attention. If hydraulic fluid gets on skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking.

Failure to follow these warnings may result in injury to personnel.

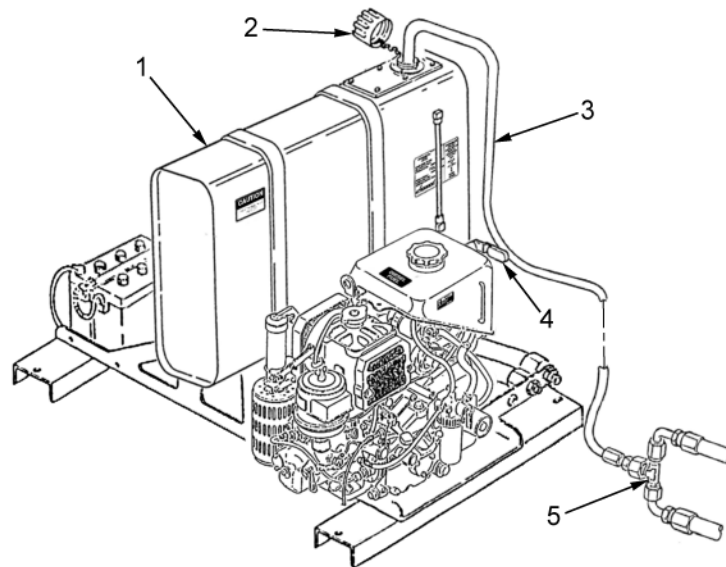
CAUTION

- Throughout the entire flushing procedure, continually check filter indicator on system filter. If an indicator shows that the filter is contaminated, stop the procedure and replace filter element; then, continue with flushing procedure or damage to equipment may result.
- Check fluid level in hydraulic tank. DO NOT allow fluid level to drop more than 2 in. (5 cm) below bottom line of FULL mark or damage to equipment may result.

NOTE

This preparation procedure requires the use of a Y-hose and flushing filter element from the Flushing Hose Kit (WP 0164).

1. Close oil valve (Figure 1, Item 4) on hydraulic tank (Figure 1, Item 1).
2. Remove filter element from system filter and replace with element (WP 0120) from Flushing Hose Kit (WP 0164).
3. Open oil valve (Figure 1, Item 4) on hydraulic tank (Figure 1, Item 1).
4. Close all suspension isolation valves, handles facing outboard (WP 0004). Pull handle of gooseneck isolation valve and suspension shutoff valve to ADJUST position (WP 0004).
5. Remove hydraulic tank cap (Figure 1, Item 2) from filler neck on hydraulic tank (Figure 1, Item 1).
6. Insert open end of 75 ft. (22.9 m) return hose assembly (Figure 1, Item 3) of Y-hose assembly (Figure 1, Item 5) into filler neck of hydraulic tank (Figure 1, Item 1).
7. Use electrical tiedown straps to secure end of return hose assembly (Figure 1, Item 3) into top of hydraulic tank (Figure 1, Item 1) to support weight of hose and to prevent hose from being dropped or pulled away from hydraulic tank.



HETT0241

Figure 1. Preparation.

8. Start Auxiliary Power Unit (APU) (WP 0005).

END OF TASK**HYDRAULIC TANK FLUSHING**

1. Shut down APU (WP 0005).

NOTE

To avoid damage to equipment, do not attempt to make any adjustments to the platform, steering, or gooseneck until all hydraulic systems are bled and air is removed from the system. If adjustments are attempted, air pockets may move through the system and may cause unexpected movements or premature component failure.

2. Refer to WP 0040, steps 6 through 11, and drain hydraulic tank with gooseneck and platform set at their existing positions.
3. Cut and remove electrical tiedown straps used to secure Y-hose return line to hydraulic tank. Remove return hose from hydraulic tank filler neck and set aside, clear of work area.

CAUTION

DO NOT allow dust, dirt, or other contaminants to enter the open hydraulic tank or hydraulic fluid may be recontaminated and damage to equipment may result.

4. Access hydraulic tank (Figure 2, Item 1) for flushing as follows:
 - a. Remove six screws (Figure 2, Item 2) and filler neck assembly (Figure 2, Item 4) from access cover (Figure 2, Item 7).
 - b. Remove six nuts (Figure 2, Item 5), washers (Figure 2, Item 6), access cover (Figure 2, Item 7), and gasket (Figure 2, Item 8) from hydraulic tank (Figure 2, Item 1). Discard gasket.

WARNING



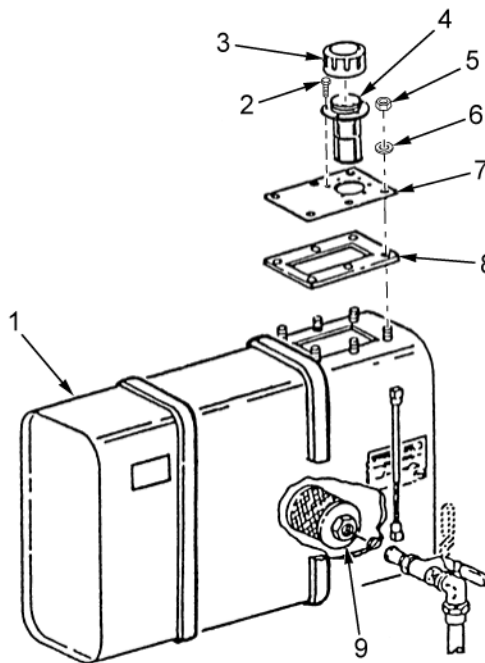
SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
 - The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
 - Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
 - Fire extinguishers should be placed nearby when using solvent cleaning compound.
 - Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
 - Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.
- Failure to follow these warnings may result in serious injury or death to personnel.

CAUTION

Lint-free wiping rags used for cleaning should be rotated or turned to prevent contaminants from being re-exposed to clean surfaces.

5. Clean inside of hydraulic tank (Figure 2, Item 1) using lint-free wiping rags. Clean all parts removed using lint-free wiping rags.
6. Use an adjustable automotive wrench to unscrew and remove hydraulic tank filter (Figure 2, Item 9).
7. Clean hydraulic tank filter (Figure 2, Item 9) using dry cleaning solvent. Reinstall hydraulic tank filter back into hydraulic tank (Figure 2, Item 1).
8. Reassemble hydraulic tank (Figure 2, Item 1) as follows:
 - a. Install gasket (Figure 2, Item 8) and access cover (Figure 2, Item 7) to hydraulic tank (Figure 2, Item 1) and secure with six washers (Figure 2, Item 6) and nuts (Figure 2, Item 5).
 - b. Install filler neck assembly (Figure 2, Item 4) to access cover (Figure 2, Item 7) and secure with six screws (Figure 2, Item 2).
9. Fill hydraulic tank (Figure 2, Item 1) with new hydraulic fluid. Install hydraulic tank cap (Figure 2, Item 3) onto filler neck assembly (Figure 2, Item 4).



HETT0242

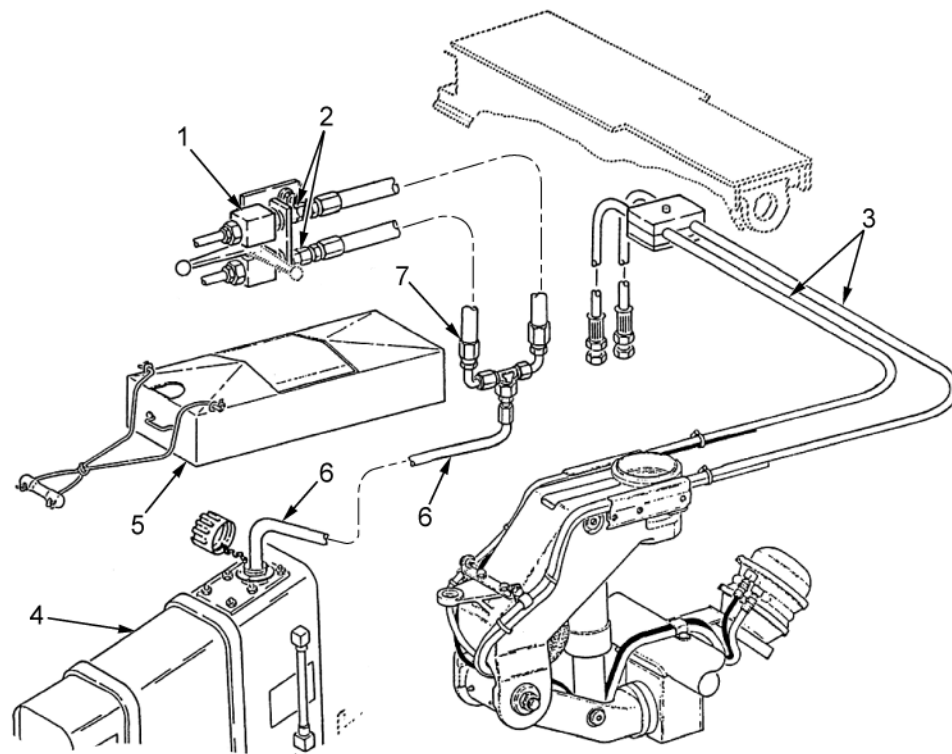
Figure 2. Hydraulic Tank Flushing.

END OF TASK

SUSPENSION SYSTEM FLUSHING**NOTE**

- This procedure requires the use of a Y-hose.
- A drain pan must be placed under hose assemblies to catch excess fluid drainage. Fluid collected into drain pan should be drained into waste oil receptacle as often as needed.

1. Place drain pan (Figure 3, Item 5) under No. 1 streetside suspension isolation valve (Figure 3, Item 1).
2. At No. 1 streetside suspension assembly, remove two suspension hoses (Figure 3, Item 3) from tube nipples (Figure 3, Item 2). Install caps/plugs into hoses.
3. Remove caps/plugs installed and connect free ends of Y-hose assembly (Figure 3, Item 7) to tube nipples (Figure 3, Item 2) on suspension isolation valve (Figure 3, Item 1).
4. Open suspension isolation valve (Figure 3, Item 1) at affected suspension assembly, handle facing forward toward front of semitrailer.
5. Pull up and hold front suspension streetside valve handle (WP 0004). Have a person check hydraulic tank (Figure 3, Item 4) for fluid flowing back through return hose (Figure 3, Item 6).
6. Hold valve handle for 15 minutes after fluid starts flowing back into hydraulic tank (Figure 3, Item 4), and then release valve handle. Monitor filter indicator.
7. Close affected suspension isolation valve (Figure 3, Item 1), handle facing outboard.
8. At No. 1 forward streetside suspension assembly, remove Y-hose assembly (Figure 3, Item 7) from tube nipples (Figure 3, Item 2). Install caps/plugs into hoses.
9. Remove caps/plugs installed into suspension hose assemblies (Figure 3, Item 3) and reconnect suspension hose assemblies to tube nipples (Figure 3, Item 2).
10. Repeat steps 1 through 9 of this procedure for each suspension assembly until all ten suspension assemblies have been flushed. Operate appropriate valve handles for each suspension assembly as required (WP 0004). Monitor filter indicator.
11. After all ten suspension hose assemblies and isolation valves are flushed, install caps/plugs onto Y-hose assembly (Figure 3, Item 7). Leave return hose assembly (Figure 3, Item 6) secured to hydraulic tank (Figure 3, Item 4).



HETT0243

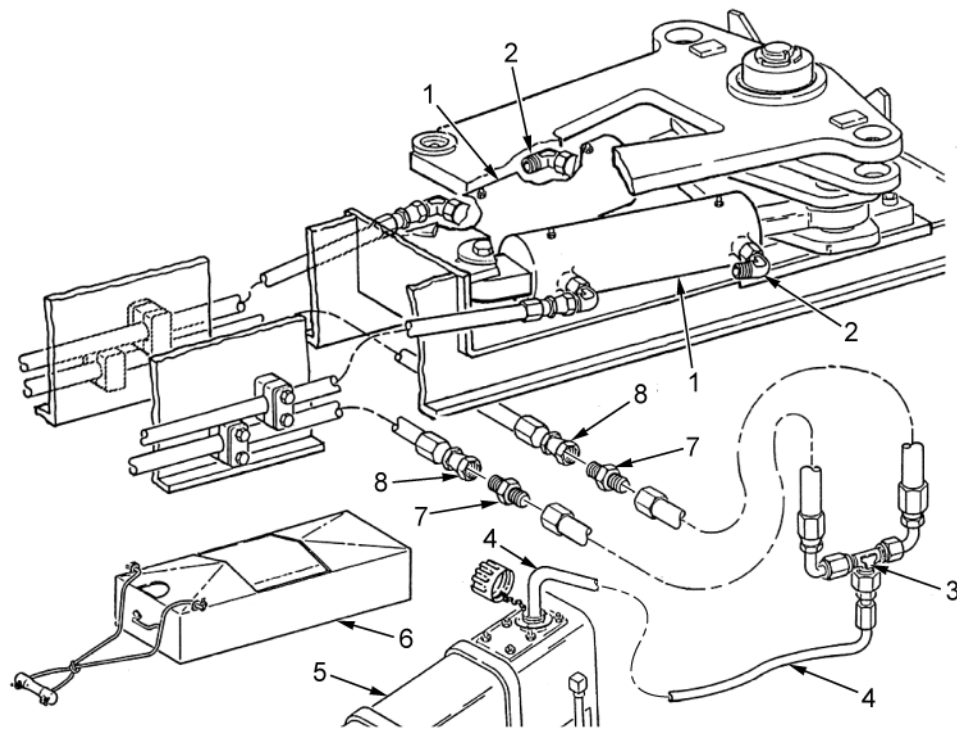
Figure 3. Suspension System Flushing.

END OF TASK

STEERING SYSTEM FLUSHING**NOTE**

- This procedure requires use of a Y-hose and two 5/8 to 3/4 in. (12.7 to 7.62 cm) straight adapters.
- A drain pan must be placed under the hose assemblies to collect excess fluid drainage. Fluid collected into drain pan should be drained into waste oil receptacle as often as needed.

1. Place drain pan (Figure 4, Item 6) under hose assemblies (Figure 4, Item 8) at aft elbow fittings (Figure 4, Item 2) on both platform steering cylinders (Figure 4, Item 1).
2. Tag and disconnect two hose assemblies (Figure 4, Item 8) from aft elbow fittings (Figure 4, Item 2) on both platform steering cylinders (Figure 4, Item 1). Install caps onto each elbow fitting.
3. Connect a 5/8 to 3/4 in. (12.7 to 7.62 cm) straight adapter (Figure 4, Item 7) to each hose assembly (Figure 4, Item 8). Remove caps/plugs installed and connect free ends of Y-hose (Figure 4, Item 3) to straight adapters.
4. Pull up and hold handle of steering control valve (WP 0004). Have a second person check return hose (Figure 4, Item 4) at hydraulic tank filler neck to ensure hydraulic fluid is flowing back into hydraulic tank (Figure 4, Item 5).
5. Continue to hold handle of steering control valve for a minimum of 10 minutes; then, release valve handle. Monitor filter indicator.
6. Push down and hold handle of steering control valve. Have a second person check return hose (Figure 4, Item 4) at hydraulic tank filler neck to ensure hydraulic fluid is flowing back into hydraulic tank (Figure 4, Item 5).
7. Continue to hold handle of steering control valve (WP 0004) for a minimum of 10 minutes; then, release valve handle. Monitor filter indicator.
8. Remove ends of Y-hose (Figure 4, Item 3) from two straight adapters (Figure 4, Item 7) and install caps/plugs into end of Y-hose.
9. Remove two straight adapters (Figure 4, Item 7) from two hose assemblies (Figure 4, Item 8). Install caps/plugs onto straight adapters.
10. Remove caps/plugs installed on elbow fittings (Figure 4, Item 2) on aft port of steering cylinders (Figure 4, Item 1). Connect two hose assemblies (Figure 4, Item 8) back onto elbow fittings.
11. Repeat steps 1 through 10 for front hoses/fittings on both platform steering cylinders. Monitor filter indicator.
12. Repeat steps 1 through 10 for rear hoses/fittings on both gooseneck steering cylinders. Monitor filter indicator.
13. Repeat steps 1 through 10 for front hoses/fittings on both gooseneck steering cylinders. Monitor filter indicator.
14. Leave return hose assembly secured to hydraulic tank (Figure 4, Item 5).



HETT0244

Figure 4. Steering System Flushing.

END OF TASK

GOOSENECK CYLINDER FLUSHING

NOTE

This procedure does not require use of the Y-hose.

1. Pull up and hold handle of gooseneck control valve (WP 0004) and raise gooseneck as high as it will go. Release handle.
2. Move gooseneck support out from under gooseneck.
3. Push down and hold handle of gooseneck control valve (WP 0004) and lower gooseneck as low as it will go. Release handle.
4. Repeat steps 1 and 3 five times to flush gooseneck cylinders. Monitor filter indicator.
5. Raise gooseneck to normal running height (WP 0011). Place gooseneck support under gooseneck and lower gooseneck onto support.

END OF TASK

STEERING CYLINDER FLUSHING

NOTE

A drain pan must be placed to collect excess fluid drainage. Fluid collected into drain pan should be drained into waste oil receptacle as often as needed.

1. Place drain pan (Figure 5, Item 3) on the ground under streetside platform steering cylinder (Figure 5, Item 1) and partially under main beam to help collect fluid that will drain onto main beam and out of cylinder.
2. At bottom of streetside platform steering cylinder (Figure 5, Item 1), slowly loosen and then remove two pipe plugs (Figure 5, Item 2).
3. Allow fluid to drain from steering cylinder (Figure 5, Item 1) onto main beam and into drain pan (Figure 5, Item 3) until most of fluid stops draining from cylinder.

WARNING



- Person operating steering valve at the hydraulic control module must operate steering valve so that enough pressure is applied to the cylinder to force fluid out of the cylinder. **DO NOT** allow steerable axles to move or too much pressure will be applied.
- Person watching fluid drain from cylinder must stand back away from platform, keeping the cylinder in full sight, to avoid fluid from being sprayed onto them.

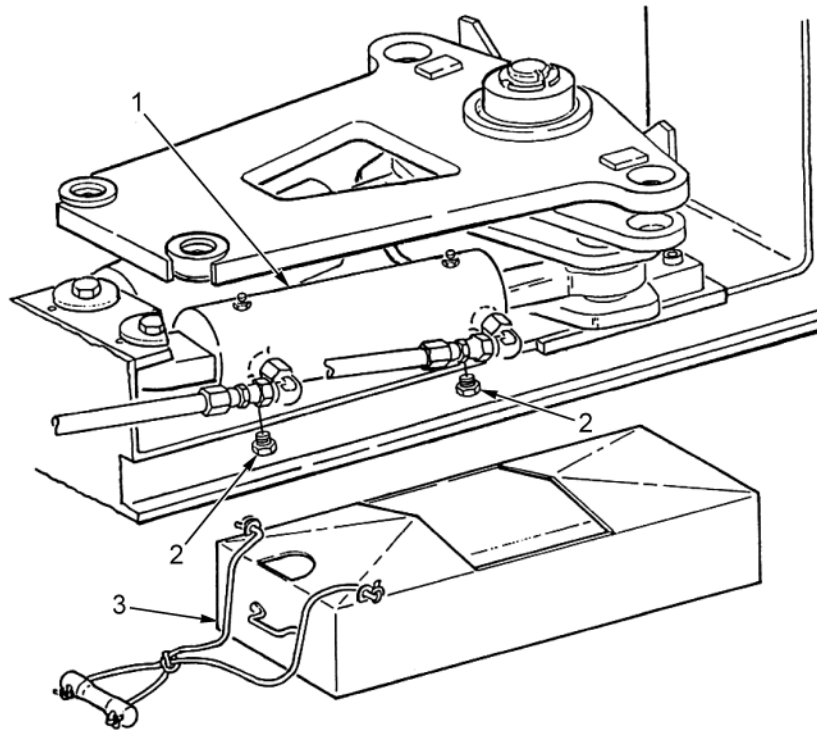
Failure to follow these warnings may result in serious injury to personnel.

NOTE

In order to adequately perform the following steps, one person must operate the steering valve while another person checks fluid draining out of the cylinder.

4. Using one person stationed at hydraulic control module, slowly operate steering valve for a left turn (WP 0004). Use caution not to turn any of the steerable axles. If axles start to move, release steering valve handle; then, operate handle again until axles do not move. Observe fluid draining out of steering cylinder (Figure 5, Item 1).

5. Continue to hold pressure on steering valve (WP 0004) until a steady stream of hydraulic fluid flows out of steering cylinder (Figure 5, Item 1) for approximately 10 seconds. Then, release steering valve handle. Monitor hydraulic tank fluid indicator.
6. Slowly operate steering valve for a right turn (WP 0004), being careful not to turn any of the steerable axles. If axles start to move, release steering valve handle. Then, operate handle again until axles do not move. Second person must observe fluid draining out of steering cylinder (Figure 5, Item 1).
7. Continue to hold handle for steering valve (WP 0004) until a steady stream of hydraulic fluid flows out of steering cylinder (Figure 5, Item 1) for approximately 10 seconds. Then, release handle of steering valve. Monitor hydraulic tank fluid indicator.
8. Allow all fluid inside steering cylinder (Figure 5, Item 1) to drain into drain pan (Figure 5, Item 3) until fluid stops.
9. Install two pipe plugs (Figure 5, Item 2) into bottom of steering hydraulic cylinder (Figure 5, Item 1).



HETT0245

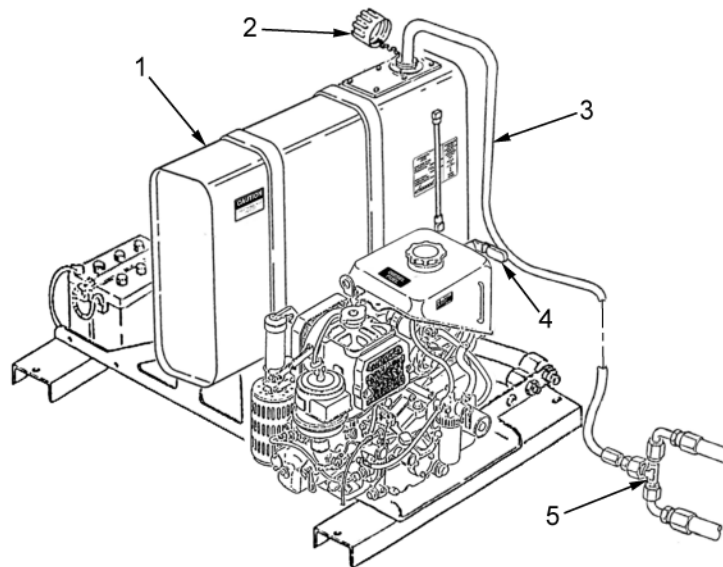
Figure 5. Steering Cylinder Flushing.

10. Check fluid level in hydraulic tank and refill with new hydraulic fluid as necessary (WP 0041).
11. Repeat steps 1 through 10 for curbside platform steering cylinder. Monitor hydraulic tank fluid indicator.
12. Repeat steps 1 through 10 for curbside gooseneck steering cylinder. Monitor hydraulic tank fluid indicator.
13. Repeat steps 1 through 10 for streetside gooseneck steering cylinder. Monitor hydraulic tank fluid and filter indicators.

END OF TASK

RESTORATION

1. Perform hydraulic tank flushing to remove any remaining contaminants in hydraulic tank. If required, shut down APU (WP 0005).
2. Close oil valve (Figure 6, Item 4) on hydraulic tank (Figure 6, Item 1).
3. Remove flushing filter from system and install new system filter (WP 0118).
4. Open oil valve (Figure 6, Item 4) on hydraulic tank (Figure 6, Item 1).
5. Remove return hose (Figure 6, Item 3) and Y-hose assembly (Figure 6, Item 5) from hydraulic tank (Figure 6, Item 1). Remove all Flushing Hose Kit parts. Clean Flushing Hose Kit parts as required and ensure all openings have caps/plugs installed.
6. Replace hydraulic tank cap (Figure 6, Item 2).



HETT0246

Figure 6. Restoration.

7. Open all ten suspension isolation valves (WP 0004).
8. Start APU (WP 0005).
9. Adjust platform height (WP 0008) to remove trapped air.
10. Operate gooseneck system (WP 0011) to remove trapped air.
11. Adjust platform (WP 0008) to normal road height of 43 in. (109 cm).
12. Shut down APU (WP 0005).

END OF TASK**FOLLOW-ON MAINTENANCE**

Bleed hydraulic system as required (WP 0041).

END OF WORK PACKAGE

FIELD MAINTENANCE

HYDRAULIC FILTER ELEMENT

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Lockwasher (6)

Personnel Required

2

Materials/Parts

Hydraulic Fluid (WP 0170, Item 17)
Petroleum Jelly (WP 0170, Item 21)
Rag, Wiping (WP 0170, Item 23)
Preformed Packing (1)
Filter Element (1)

Equipment Conditions

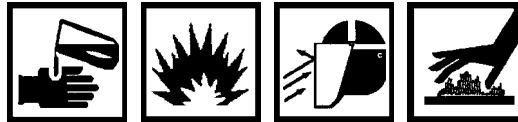
Hydraulic oil valve at reservoir closed (handle upright)
(WP 0004)
One suspension valve (hydraulic control console) secured
in full position (WP 0004)

GENERAL INFORMATION

This work package contains instructions for disassembly, inspection, and assembly of the hydraulic filter element.

GENERAL SAFETY INSTRUCTIONS

WARNING



- Hydraulic fluid may be absorbed through the skin. Avoid prolonged exposure to skin and wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into the eyes, flush them immediately with water and seek medical attention. If hydraulic fluid gets on skin, wash thoroughly with soap and water. Wash hands thoroughly prior to eating or smoking.
- Hydraulic fluid may be hot if system has been in operation. Allow time for system to cool before performing maintenance.
- Residual pressure may remain in hydraulic lines; open fittings slowly.

Failure to follow these warnings may result in serious injury to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or foreign material from entering the hydraulic system or damage to equipment may result.

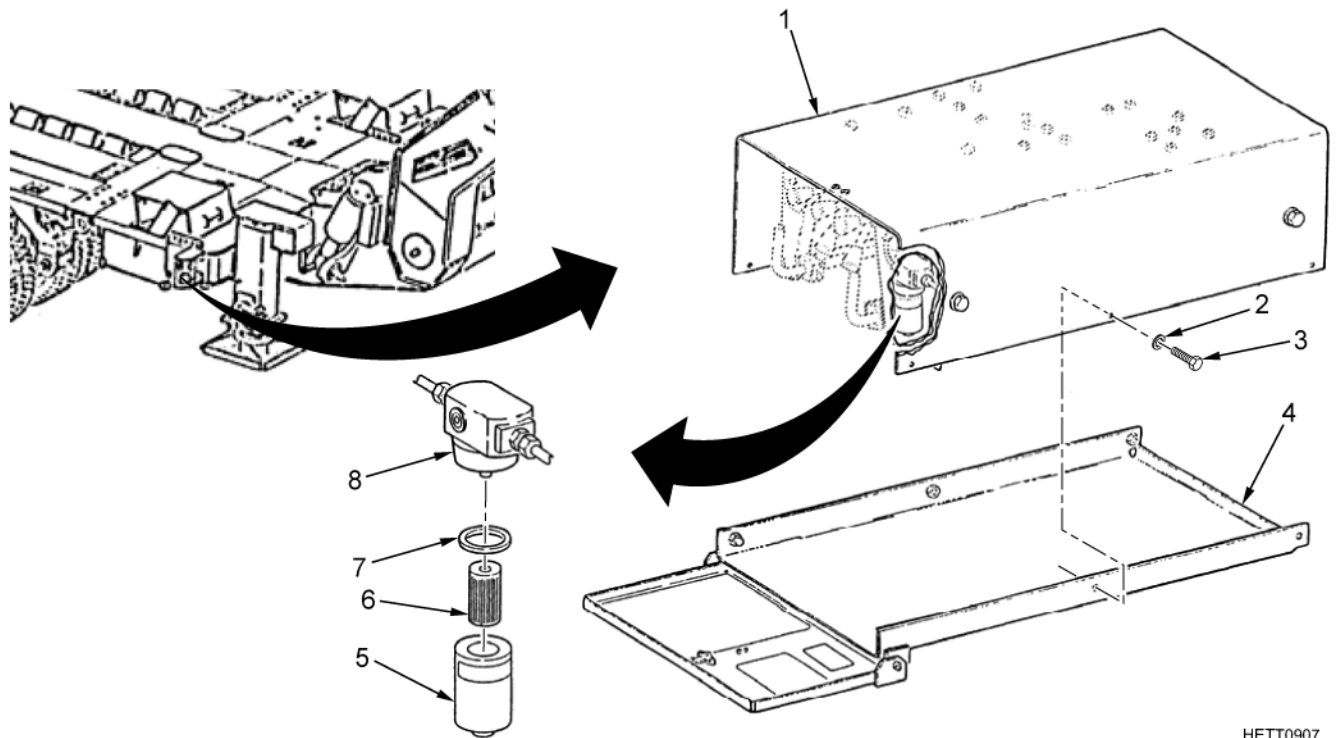
ELEMENT CHANGE

1. Ensure hydraulic control module door panel is lowered (WP 0004).
2. Use two people to remove six capscrews (Figure 1, Item 3), lockwashers (Figure 1, Item 2), and lower panel (Figure 1, Item 4) from hydraulic control module (Figure 1, Item 1). Carefully remove lower panel, with panel door attached, out from under semitrailer and place on platform. Discard six lockwashers.
3. Place drain pan under hydraulic control module.
4. Unscrew and remove filter element housing (Figure 1, Item 5) from filter block (Figure 1, Item 8).
5. Remove filter element (Figure 1, Item 6) and preformed packing (Figure 1, Item 7). Discard filter element and preformed packing. Pour fluid inside of filter element housing (Figure 1, Item 5) into drain pan.

WARNING**SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
 - The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
 - Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
 - Fire extinguishers should be placed nearby when using solvent cleaning compound.
 - Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
 - Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.
- Failure to follow these warnings may result in serious injury or death to personnel.

6. Clean filter housing (Figure 1, Item 5) with wiping rags. Clean all other components with dry cleaning solvent.
7. Inspect filter assembly for cracked or broken sight gauge, stripped threads, deformed preformed packing grooves, nicks, cracks, dents, or evidence of leakage. Replace defective components as required.
8. Install new filter element (Figure 1, Item 6) into filter element housing (Figure 1, Item 5). Apply a thin coat of petroleum jelly onto preformed packing (Figure 1, Item 7). Install new preformed packing (Figure 1, Item 7) onto filter block (Figure 1, Item 8).
9. Install filter element housing (Figure 1, Item 5), with filter element and preformed packing attached, to filter block (Figure 1, Item 8). Use 1 1/4 in. (2.54 cm) wrench to tighten filter element housing onto filter block.
10. Use two people to align and install lower panel (Figure 1, Item 4), with door panel attached, onto hydraulic control module (Figure 1, Item 1). Secure lower panel in place by installing six new lockwashers (Figure 1, Item 2) and capscrews (Figure 1, Item 3). Close door panel.
11. Refill hydraulic tank as required (WP 0039).
12. Perform hydraulic system bleeding as required (WP 0041).



HETT0907

Figure 1. Element Change.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**RADIATOR FLUID FILL**

INITIAL SETUP:**Tools and Special Tools**

Standard Army Tool Set (WP 0168, Item 28)

Personnel Required

1

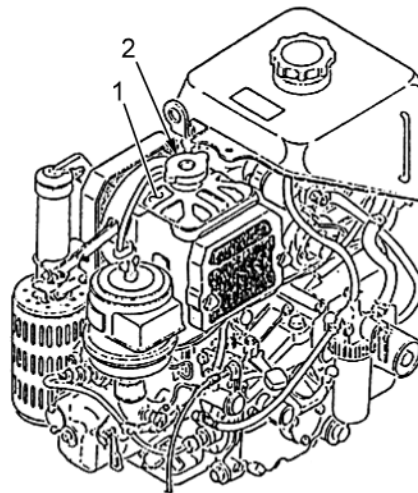
Materials/PartsAntifreeze (WP 0170, Item 2)

GENERAL INFORMATION

This work package contains instructions for the radiator fluid fill.

FLUID FILL**WARNING**

- When hot, radiator temperature may exceed 210°F (100°C) and maintain pressure up to 16 psi (108 kPa). **DO NOT** open radiator while hot or injury to personnel may result.
 - Ethylene glycol is toxic to skin, eyes, and respiratory tract. Avoid skin and eye contact. Good general ventilation is normally adequate.
1. Remove radiator cap (Figure 1, Item 2).
 2. Fill radiator (Figure 1, Item 1) with 1.3 qt (1.2 L) of 70/30 mixture (70 percent antifreeze and 30 percent water).
 3. Install radiator cap (Figure 1, Item 2).



HETT0908

Figure 1. Fluid Fill.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
GOOSENECK COMPONENT ASSEMBLY

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Locknut (4)
Locknut (6)
Locknut (8)

Materials/Parts

Rag, Wiping (WP 0170, Item 23)
Solder (WP 0170, Item 30)
Solvent, Dry Cleaning (WP 0170, Item 32)
Strap, Tiedown (as required) (WP 0170, Item 33)
Locknut (4)

Personnel Required

1

Equipment Conditions

Intervehicular cables disconnected (WP 0011)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the gooseneck component assembly.

REMOVAL

NOTE

For semitrailers with LED lights, disregard steps 1 thru 5 below.

1. Remove four locknuts (Figure 1, Item 19) and screws (Figure 1, Item 14) and lift fixed resistor R2 (Figure 1, Item 20) off of gooseneck component assembly (Figure 1, Item 12). Discard locknuts.
2. Tag and disconnect wires (Figure 1, Item 21) from both sides of fixed resistor R2 (Figure 1, Item 20) and remove resistor R2 from gooseneck component assembly (Figure 1, Item 12).
3. Remove two locknuts (Figure 1, Item 5) and screws (Figure 1, Item 13) and lift fixed resistor R1 (Figure 1, Item 7) off of gooseneck component assembly (Figure 1, Item 12). Discard locknuts.
4. Remove two locknuts (Figure 1, Item 5) and screws (Figure 1, Item 13) and lift fixed resistor R3 (Figure 1, Item 6) off of gooseneck component assembly (Figure 1, Item 12). Discard locknuts.

WARNING

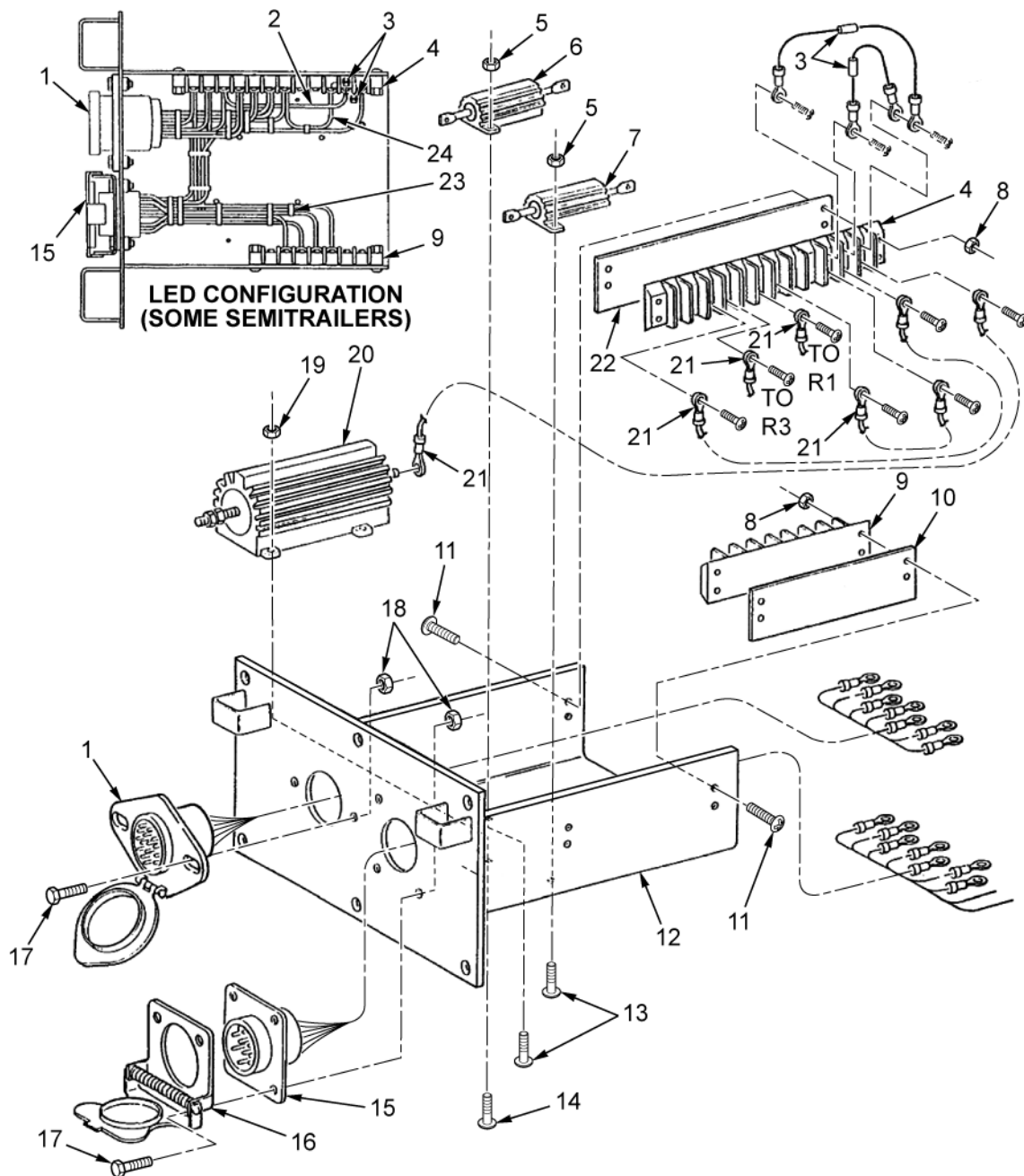


Soldering fumes are toxic. Work in well-ventilated area to avoid breathing these fumes. Failure to follow this warning may result in injury to personnel.

CAUTION

Rosin core solder contains flux, which is corrosive. All soldered connections must be cleaned of all flux residue or damage to equipment may result.

5. Cut and remove tiedown straps (Figure 1, Item 23) securing electrical wires (Figure 1, Item 21). Discard tiedown straps. Use soldering gun to tag and unsolder electrical wires from both fixed resistors R1 (Figure 1, Item 7) and R3 (Figure 1, Item 6). Remove both fixed resistors R1 and R3 from gooseneck component assembly (Figure 1, Item 12).
6. Refer to electrical schematic rear foldout Figure FO-1 for incandescent lights or Figure FO-1.1 for LED lights. Tag and disconnect electrical leads for connectors J1 (Figure 1, Item 15) and J2 (Figure 1, Item 1) from terminal boards TB1 (Figure 1, Item 9) and TB2 (Figure 1, Item 4).
7. Refer to electrical schematic rear foldout Figure FO-1 for incandescent lights. Tag and disconnect five point-to-point jumper wires (Figure 1, Item 21) and two diodes (Figure 1, Item 3) from terminal board TB2 (Figure 1, Item 4).
8. Refer to electrical schematic rear foldout Figure FO-1.1 for LED lights. Tag and disconnect point-to-point jumper wire (Figure 1, Item 24) and two diodes (Figure 1, Item 3) from terminal board TB2 (Figure 1, Item 4). Leave Zener lead assembly (Figure 1, Item 2) at this time. Proceed to steps 9 thru 12.
9. Remove six locknuts (Figure 1, Item 18), capscrews (Figure 1, Item 17), and receptacle cover (Figure 1, Item 16) from gooseneck component assembly (Figure 1, Item 12). Discard locknuts.
10. Remove connectors J1 (Figure 1, Item 15) and J2 (Figure 1, Item 1) from gooseneck component assembly (Figure 1, Item 12).
11. Remove four locknuts (Figure 1, Item 8), screws (Figure 1, Item 11), terminal board TB1 (Figure 1, Item 9), and terminal marker strip (Figure 1, Item 10) from gooseneck component assembly (Figure 1, Item 12). Discard locknuts.
12. Remove four locknuts (Figure 1, Item 8), screws (Figure 1, Item 11), terminal board TB2 (Figure 1, Item 4), and terminal marker strip (Figure 1, Item 22) from gooseneck component assembly (Figure 1, Item 12). Discard locknuts.



HETT0924

Figure 1. Gooseneck Component Removal.

END OF TASK

REPAIR

1. Inspect connectors J1 (Figure 2, Item 10) and J2 (Figure 2, Item 1) for frayed or broken wires and defective or loose terminal lugs. If defects exist, replace connectors as required.
2. Inspect for missing or unreadable wire markers and terminal marker strips (Figure 2, Item 8 and Item 14). If defective, restamp or replace wire markers and terminal marker strips. Use semitrailer electrical schematic rear foldout Figure FO-1 as a guide for proper wire markings.
3. Inspect jumper wires (Figure 2, Item 13) for frayed or broken wires and loose terminal lugs. If defective, use electrical repair kit and repair or replace point-to-point wire(s) (WP 0164).
4. Inspect for missing, cracked, or non-sealing receptacle cover (Figure 2, Item 11). If defective or missing, replace cover.
5. Use digital multimeter to check resistance of diodes (Figure 2, Item 3) in both directions and inspect diodes for defects. Refer to WP 0031. If diodes fail resistance check or are defective, replace diodes.
6. For incandescent lights, use digital multimeter to check resistance of all three fixed resistors. Readings for fixed resistors R1 (Figure 1, Item 6) and R3 (Figure 2, Item 5) should be 7.0 ohms \pm 1.0 percent. Reading for fixed resistor R2 (Figure 2, Item 12) should be 2.0 ohms \pm 1.0 percent. If a reading is not correct for a fixed resistor, replace as required.
7. For LED lights, use digital multimeter to probe Zener lead assembly (Figure 2, Item 2) for current flow. Locate ends that attach to terminals TB2-10 and TB2-2 and probe in both directions. In the 10-2 direction, current should flow unrestricted. In the 2-10 direction, 12 volts or less should flow unrestricted, and greater than 12 volts should be clipped to approximately 12 volts.

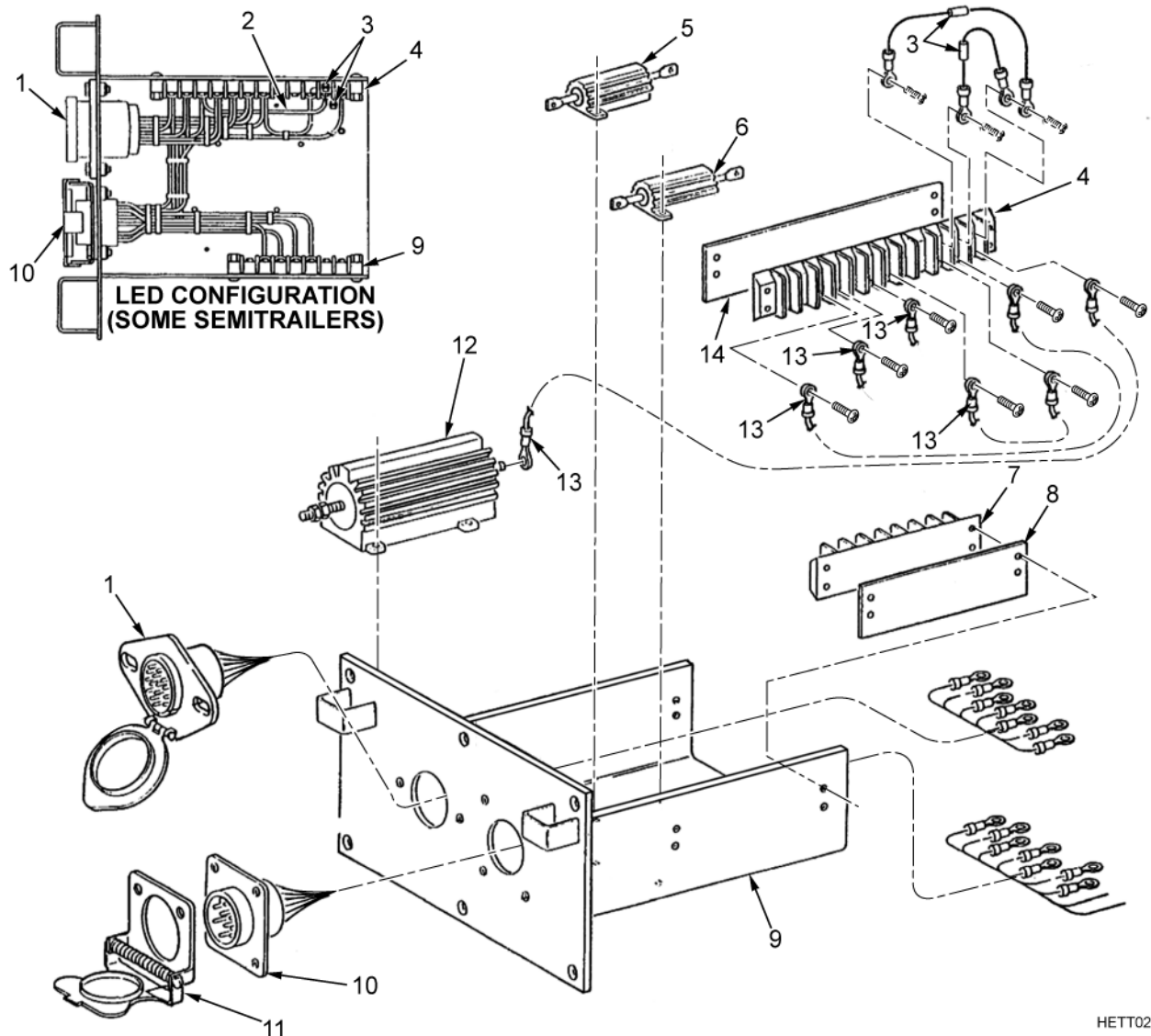
WARNING



SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
 - The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
 - Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
 - Fire extinguishers should be placed nearby when using solvent cleaning compound.
 - Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
 - Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.
- Failure to follow these warnings may result in serious injury or death to personnel.

8. Inspect terminal boards TB1 (Figure 2, Item 7) and TB2 (Figure 2, Item 4) for missing screws, breaks, cracks, and excessive corrosion. If corroded, clean using dry cleaning solvent as required. If defective, replace as required.
9. Inspect all components for corrosion. If corrosion is found, clean using dry cleaning solvent as required.
10. Refer to WP 0164 and use electrical repair kit and measuring tape to fabricate new point-to-point wires for gooseneck component assembly (Figure 2, Item 9) as required.
11. Use wire stripper to strip fabricated jumper wires (Figure 2, Item 13) to designated length and allow for terminals to be installed or wires to be soldered.
12. Use electrical repair kit to crimp new terminal lugs onto point-to-point wires as required.



HETT0248

Figure 2. Gooseneck Component Repair.

END OF TASK

INSTALLATION

1. Refer to electrical schematic rear foldout Figure FO-1 for incandescent lights and reconnect five point-to-point jumper wires (Figure 3, Item 21) and two diodes (Figure 3, Item 3) to terminal board TB2 (Figure 3, Item 4). Proceed to steps 3 thru 14.
2. Refer to electrical schematic rear foldout Figure FO-1.1 for LED lights and reconnect one point-to-point jumper wire (Figure 3, Item 24), one Zener lead assembly (Figure 3, Item 2), and two diodes (Figure 3, Item 3) to terminal board TB2 (Figure 3, Item 4). Proceed to steps 3 thru 8.
3. Align terminal board TB2 (Figure 3, Item 4) and terminal marker strip (Figure 3, Item 22) and install onto gooseneck component assembly (Figure 3, Item 12). Secure with four screws (Figure 3, Item 11) and new locknuts (Figure 3, Item 8).
4. Align terminal board TB1 (Figure 3, Item 9) and terminal marker strip (Figure 3, Item 10) and install onto gooseneck component assembly (Figure 3, Item 12). Secure with four screws (Figure 3, Item 11) and new locknuts (Figure 3, Item 8).
5. Install electrical leads for connectors J1 (Figure 3, Item 15) and J2 (Figure 3, Item 1) through gooseneck component assembly (Figure 3, Item 12).
6. Align receptacle cover (Figure 3, Item 16) to connector J1 (Figure 3, Item 15) and gooseneck component assembly (Figure 3, Item 12). Secure with four capscrews (Figure 3, Item 17) and new locknuts (Figure 3, Item 18).
7. Align connector J2 (Figure 3, Item 1) to gooseneck component assembly (Figure 3, Item 12). Secure with two capscrews (Figure 3, Item 17) and new locknuts (Figure 3, Item 18).
8. Refer to electrical schematic rear foldout Figure FO-1 for incandescent lights or Figure FO-1.1 for LED lights and connect electrical leads from connectors J1 (Figure 3, Item 15) and J2 (Figure 3, Item 1) to terminal boards TB1 (Figure 3, Item 9) and TB2 (Figure 3, Item 4).

WARNING



Soldering fumes are toxic. Work in well-ventilated area to avoid breathing these fumes. Failure to follow this warning may result in injury to personnel.

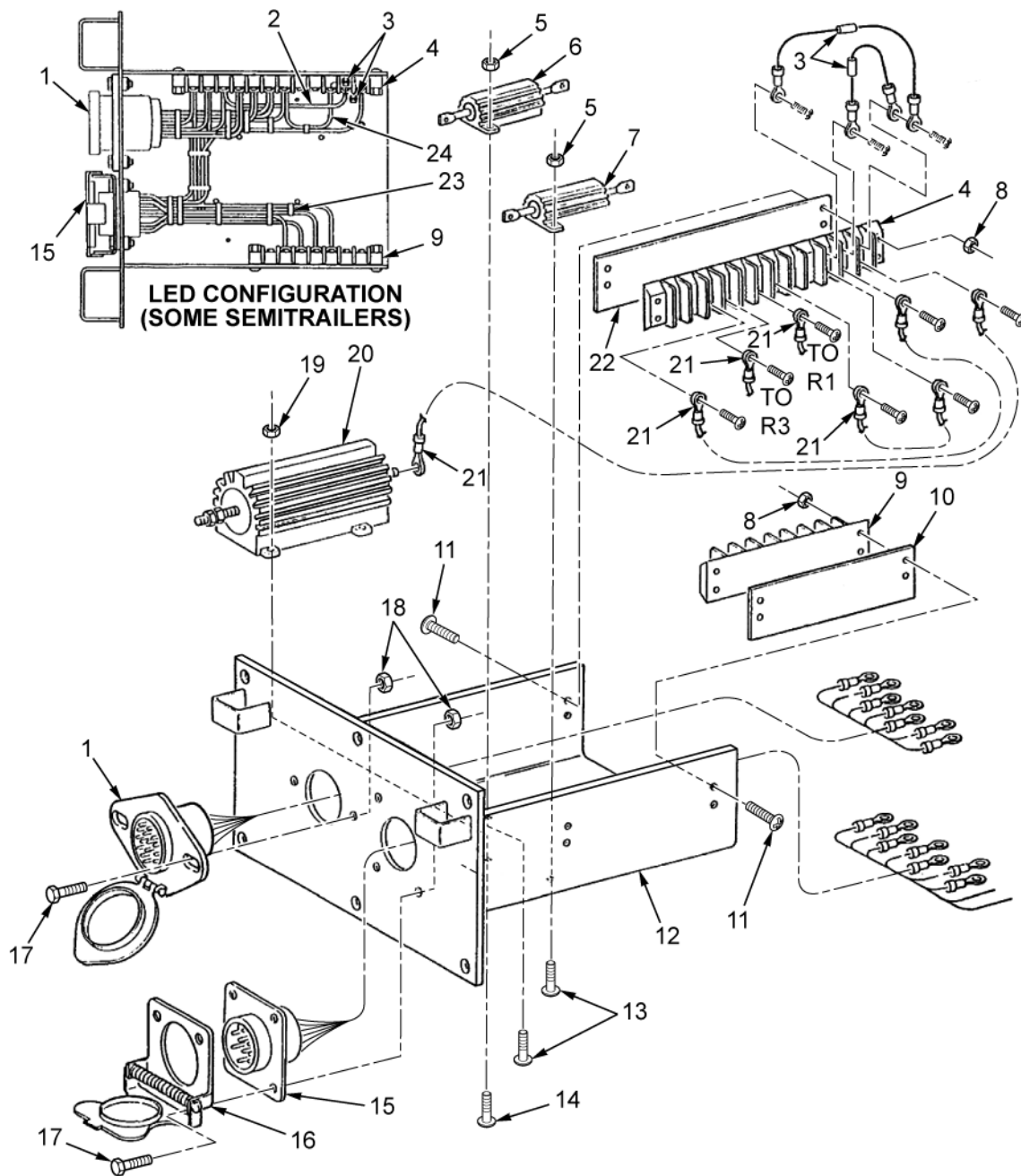
CAUTION

Rosin core solder contains flux, which is corrosive. All soldered connections must be cleaned of all flux residue or damage to equipment may result.

NOTE

For some semitrailers with LED lights, disregard steps 9 thru 14.

9. Refer to electrical schematic rear foldout Figure FO-1 and use soldering gun to solder two wires from connector J1 (Figure 3, Item 15) to fixed resistors R1 (Figure 3, Item 7) and R3 (Figure 3, Item 6). Clean all flux residue from solder joint.
10. Refer to electrical schematic rear foldout Figure FO-1 and use soldering gun to solder two point-to-point jumper wires from terminal board TB2 (Figure 3, Item 4) to fixed resistors R1 (Figure 3, Item 7) and R3 (Figure 3, Item 6). Clean all flux residue from solder joint. Secure electrical wires with tiedown straps (Figure 3, Item 23) as required.
11. Align and install fixed resistor R1 (Figure 3, Item 7) to gooseneck component assembly (Figure 3, Item 12) and secure with two screws (Figure 3, Item 13) and new locknuts (Figure 3, Item 5).
12. Align and install fixed resistor R3 (Figure 3, Item 6) to gooseneck component assembly (Figure 3, Item 12) and secure with two screws (Figure 3, Item 13) and new locknuts (Figure 3, Item 5).
13. Refer to electrical schematic rear foldout Figure FO-1 and connect a point-to-point jumper wire from terminal board TB2 (Figure 3, Item 4) to fixed resistor R2 (Figure 3, Item 20).
14. Align and install fixed resistor R2 (Figure 3, Item 20) to gooseneck component assembly (Figure 3, Item 12) and secure with four screws (Figure 3, Item 14) and new locknuts (Figure 3, Item 19).



HETT0924

Figure 3. Gooseneck Component Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Install gooseneck component assembly (WP 0045).

END OF WORK PACKAGE

0045-7/8 blank

FIELD MAINTENANCE

JUNCTION BOXES

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (WP 0168, Item 11)
 Standard Army Tool Set (WP 0168, Item 28)

Personnel Required

1

Materials/Parts

Solvent, Dry Cleaning (WP 0170, Item 32)
 Tape, Electrical (WP 0170, Item 35)
 Lockwasher (2)

Equipment Conditions

Platform at road height (WP 0008)
 Front and rear support legs lowered supporting platform
 (WP 0011 and WP 0012)
 Intervehicular cables disconnected (WP 0013)

GENERAL INFORMATION

This work package contains instructions for removal and installation for junction boxes.

REMOVAL**NOTE**

Use the following procedure for either platform junction box TB1 or TB2. To repair or replace either platform junction box TB1 or TB2, repeat this procedure as necessary.

1. Remove two screws (Figure 1, Item 4) and junction box cover (Figure 1, Item 5) from junction box (Figure 1, Item 1).
2. Refer to electrical schematic rear foldout Figure FO-1 for incandescent lights or Figure FO-1.1 for LED lights. Tag and disconnect W1, W2, W3, and W4 harnesses and jumper wires from junction box (Figure 1, Item 1).
3. Remove two nuts (Figure 1, Item 3), lockwashers (Figure 1, Item 2), and junction box (Figure 1, Item 1) from platform. Discard lockwashers.

WARNING**SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
 - The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
 - Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
 - Fire extinguishers should be placed nearby when using solvent cleaning compound.
 - Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
 - Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.
- Failure to follow these warnings may result in serious injury or death to personnel.

4. Inspect junction boxes (Figure 1, Item 1) for corrosion, breaks, cracked or missing grommets, or defective cover. If corroded, clean using dry cleaning solvent as required. If defects exist, replace junction box.
5. Inspect jumper wires and wiring harness terminal lugs for corrosion, frayed or broken wires, and looseness. If defective, use electrical repair kit and replace defective terminal lugs, jumper wires, and/or wiring harnesses.
6. Inspect jumper wires for missing or unreadable wire markers. If defect exists, replace or re-stamp wire marker. Use electrical schematic rear foldout Figure FO-1 for incandescent lights or Figure FO-1.1 for LED lights for proper wire markings.
7. Inspect loom surrounding wire bundle for fraying, cuts, and damage. If defective, use electrical tape over affected area as required to keep water from settling into harness.

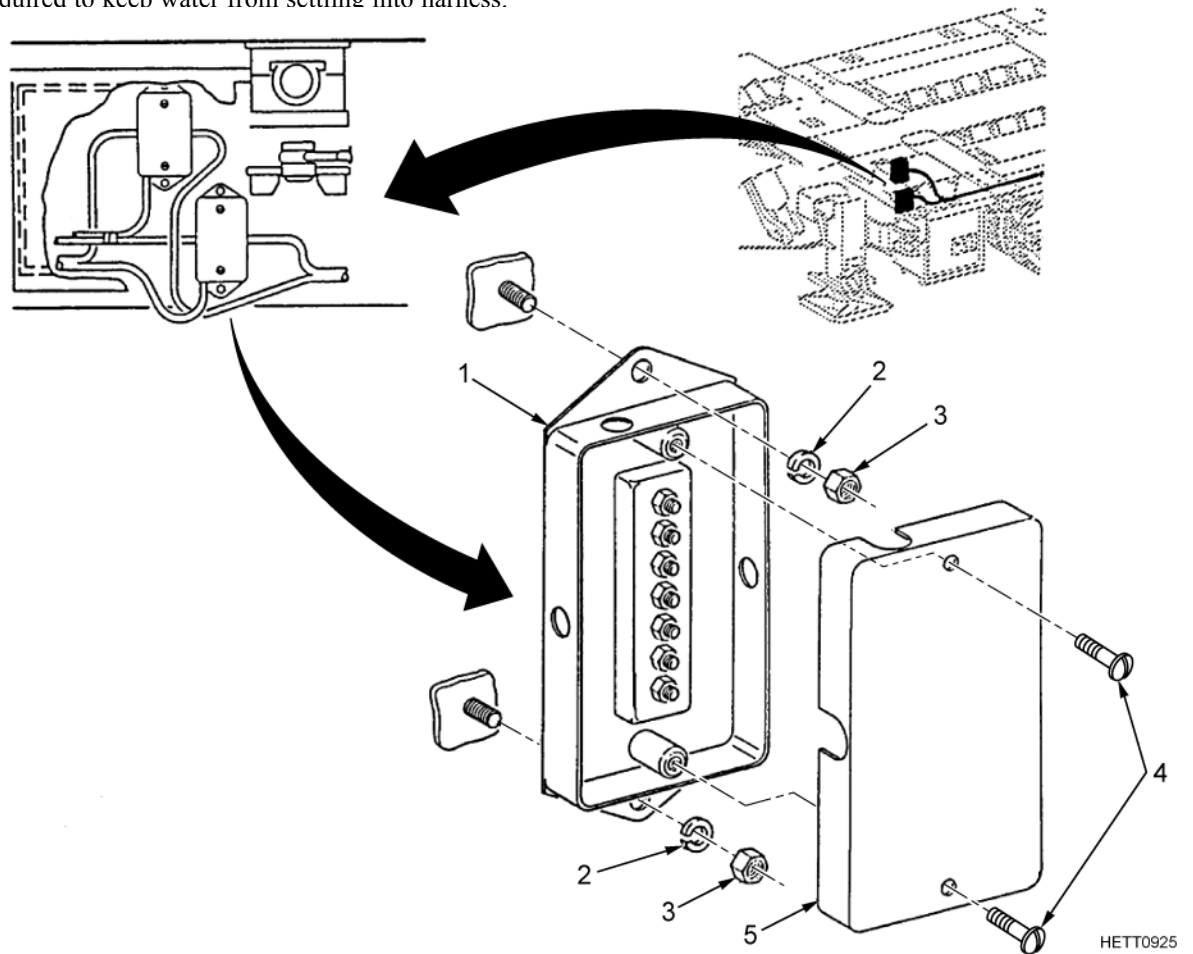


Figure 1. Removal.

END OF TASK

INSTALLATION

1. Align and install junction box (Figure 2, Item 1) to platform and secure with two new lockwashers (Figure 2, Item 2) and nuts (Figure 2, Item 3).
2. Refer to electrical schematic rear foldouts Figure FO-1 for incandescent lights or Figure FO-1.1 for LED lights. Connect jumper wires and W1, W2, W3, and W4 harnesses to junction box (Figure 2, Item 1).
3. Install cover (Figure 2, Item 5) onto junction box (Figure 2, Item 1) and secure with two screws (Figure 2, Item 4).

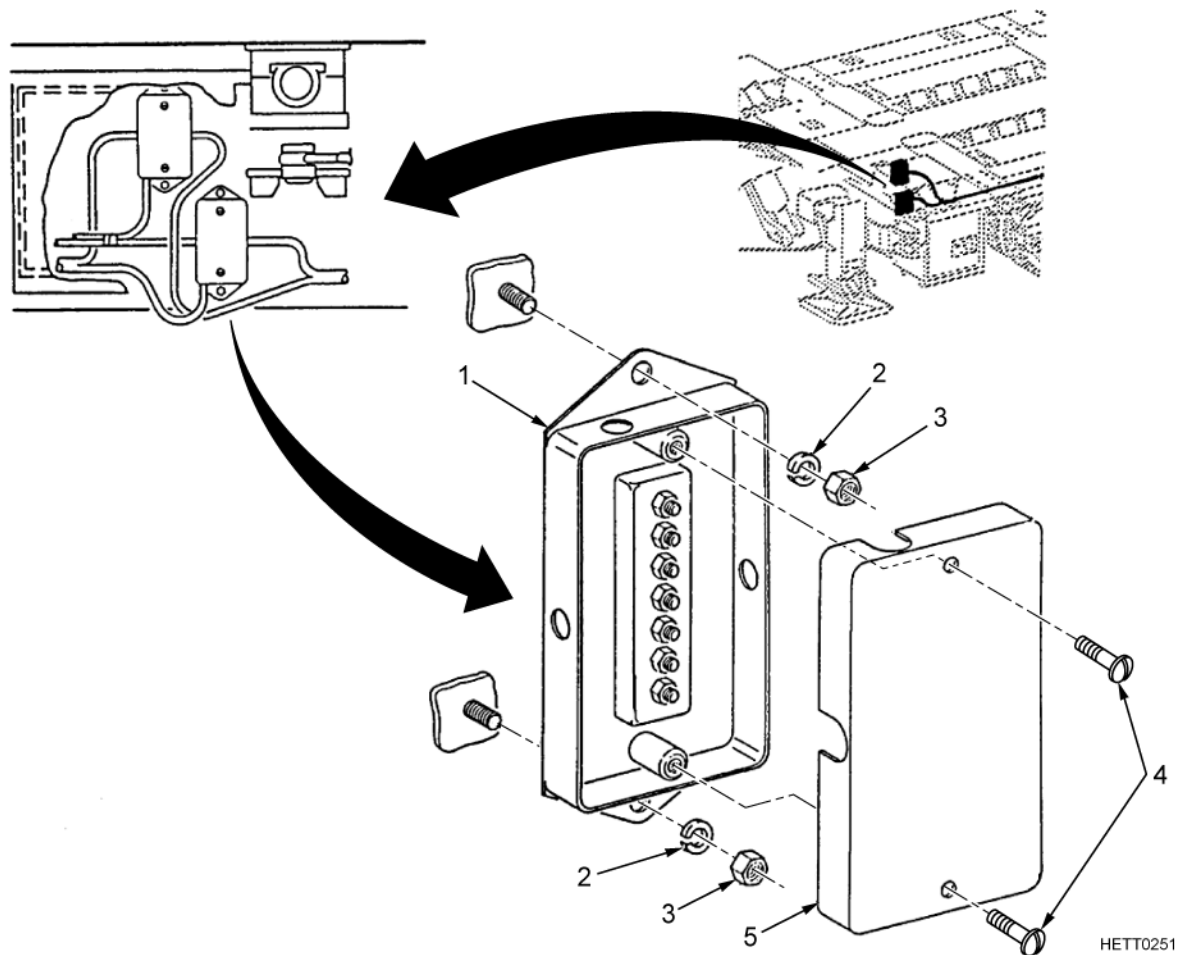


Figure 2. Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Reconnect intervehicular electrical cable and check all lights, including steering pressure indicator light, for proper operation (WP 0013).

END OF WORK PACKAGE

FIELD MAINTENANCE
COMPOSITE MARKER LIGHT

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Locknut (2)

Personnel Required

1

Materials/Parts

Rag, Wiping (WP 0170, Item 23)
Gasket (1)
Lockwasher (2)

Equipment Conditions

Semitrailer parked on level ground, parking brakes applied, and intervehicular cables disconnected (WP 0013)

GENERAL INFORMATION

This work package contains instructions for removal, repair, and installation of the composite marker light.

REMOVAL**CAUTION**

Some semitrailers are equipped with one-piece LED composite marker lights. No repair is authorized on these lights and they are not interchangeable with reparable lights.

NOTE

Use the following procedure for either the curbside or streetside composite marker light. To repair or replace both lights, repeat this procedure as necessary.

1. Refer to electrical schematic rear foldout Figure FO-1 for incandescent lights. Tag and disconnect four electrical connectors (Figure 1, Item 5) from W2 harness. Proceed to steps 2 and 3.
2. Remove two locknuts (Figure 1, Item 1), screws (Figure 1, Item 2), and composite marker light (Figure 1, Item 9) with attached mounting bracket (Figure 1, Item 8) from platform. Discard locknuts.
3. Remove two screws (Figure 1, Item 6), lockwashers (Figure 1, Item 7), and mounting bracket (Figure 1, Item 8) from composite marker light (Figure 1, Item 9). Discard lockwashers.
4. Refer to electrical schematic rear foldout Figure FO-1.1 for LED lights. Tag and disconnect four connectors (Figure 1, Item 5) from W2 harness and one connector from ground lead. Proceed to step 5.
5. Remove four screws (Figure 1, Item 4), locknuts (Figure 1, Item 11), and light (Figure 1, Item 3) from mounting bracket (Figure 1, Item 10) on platform. Discard locknuts and light.

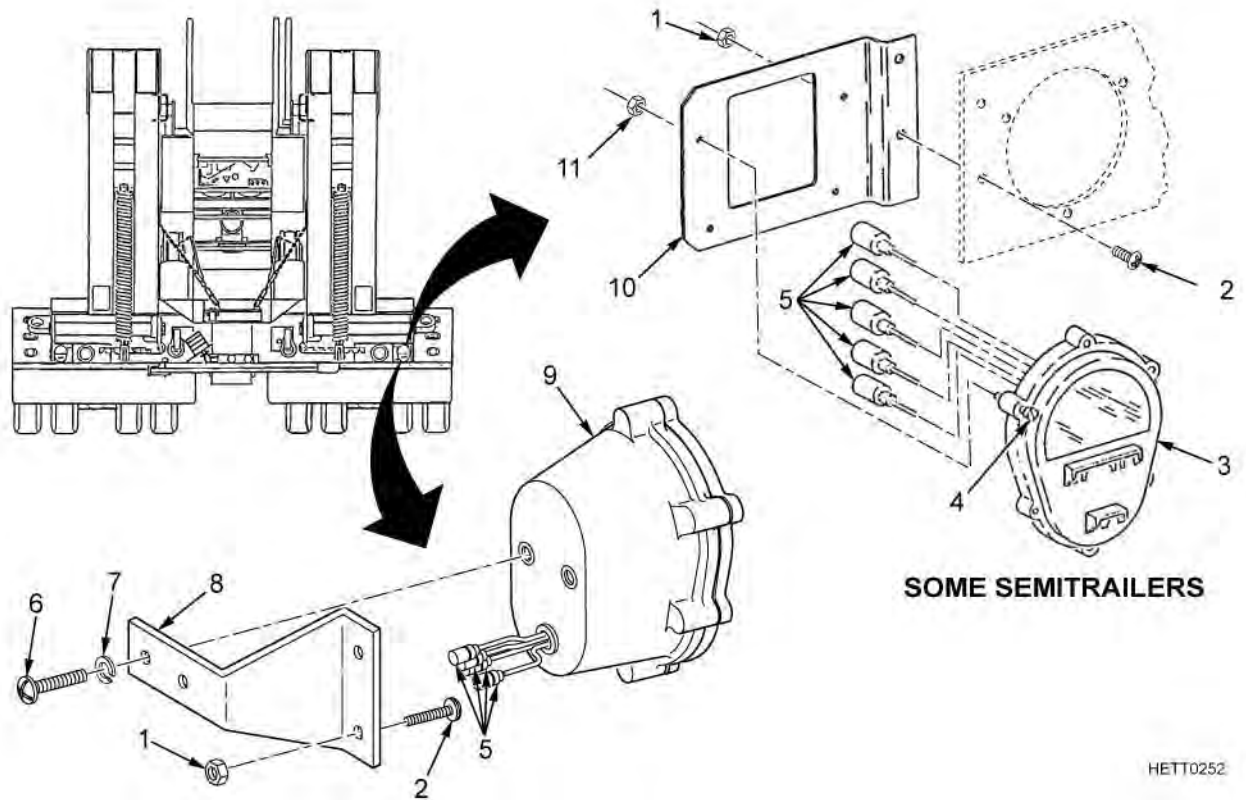


Figure 1. Composite Marker Light Removal.

END OF TASK

REPAIR**NOTE**

There is no disassembly of one-piece LED composite marker lights.

1. Loosen six captive screws (Figure 2, Item 4) and remove light lens (Figure 2, Item 7) and gasket (Figure 2, Item 10) from incandescent composite marker light (Figure 2, Item 1). Discard gasket.

NOTE

Some semitrailers have bulbs in the two lower positions (blackout lights) on the composite marker light. These bulbs should be replaced with LED.

2. Remove bulb (Figure 2, Item 2); bulb (Figure 2, Item 3); LED (Figure 2, Item 8); and LED (Figure 2, Item 9) from incandescent composite marker light (Figure 2, Item 1).
3. For incandescent lights, inspect wires (Figure 2, Item 5) and socket connectors for corrosion, frayed or broken wires, and looseness. If socket connectors are defective, use electrical repair kit and replace as required. If wires are frayed or broken, replace composite marker light (Figure 2, Item 1). Proceed to steps 4 through 6.
4. Inspect bulb socket for corrosion and defects. If corroded, clean bulb socket by wiping with a wiping rag. If socket cannot be cleaned or if socket is defective, replace composite marker light (Figure 2, Item 1).
5. Inspect for missing or cracked light lens (Figure 2, Item 7 or Item 6). If defective, replace light lens.
6. Inspect light bulbs and LED for defects. If defective, replace light bulbs.
7. For LED lights, inspect wires (Figure 2, Item 5) and socket connectors for corrosion, frayed or broken wires, and looseness. Inspect light for crack and/or defective LED. If wires or light is defective or more than 25 percent of LED does not emit light, replace light.

NOTE

There is no assembly of one-piece LED composite marker lights.

8. Install LED (Figure 2, Item 8); LED (Figure 2, Item 9); bulb (Figure 2, Item 3); and bulb (Figure 2, Item 2) into incandescent composite marker light (Figure 2, Item 1).
9. Install new gasket (Figure 2, Item 10) and light lens (Figure 2, Item 7) onto incandescent composite marker light (Figure 2, Item 1). Secure by tightening six captive screws (Figure 2, Item 4). Torque six screws to 20 to 25 in-lb (2.2 to 2.7 Nm).

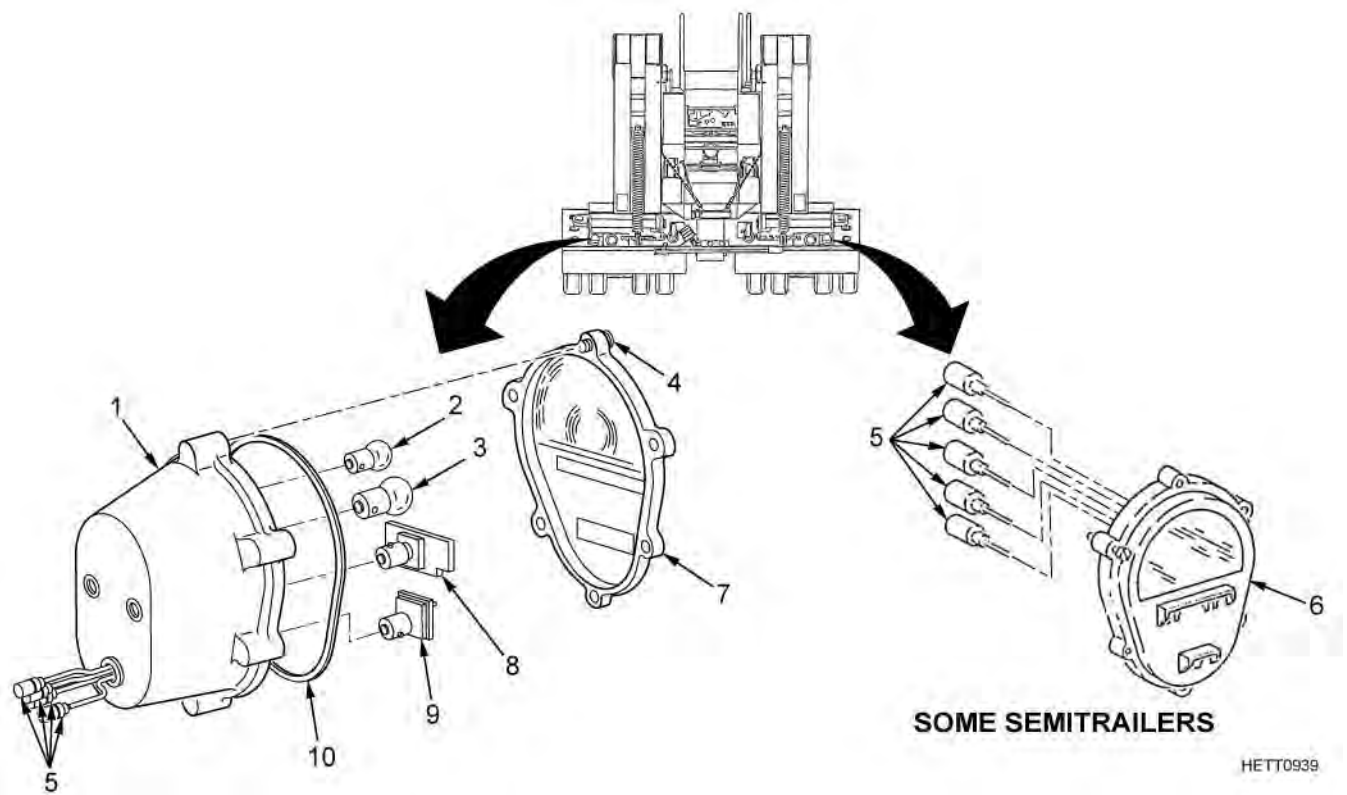
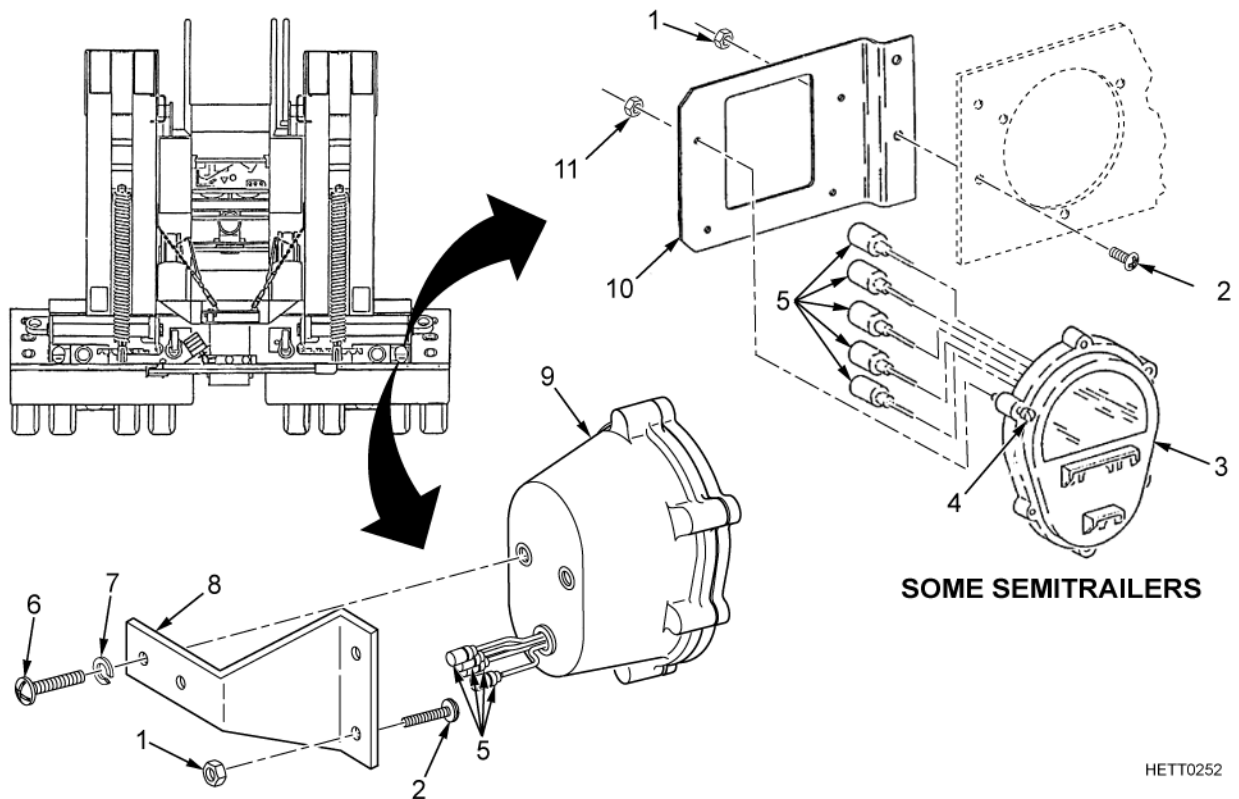


Figure 2. Composite Marker Light Repair.

END OF TASK

INSTALLATION

1. For one-piece LED composite marker light (Figure 3, Item 9), align light (Figure 3, Item 3) to mounting bracket (Figure 3, Item 10) on platform and secure with four screws (Figure 3, Item 4) and locknuts (Figure 3, Item 11). Proceed to step 2.
2. Refer to electrical schematic rear foldout Figure FO-1.1 for LED lights and reconnect four connectors to W2 harness and one connector to ground lead.
3. For incandescent composite marker light, align light (Figure 3, Item 9) to mounting bracket (Figure 3, Item 8) and secure with two screws (Figure 3, Item 6) and new lockwashers (Figure 3, Item 7). Proceed to steps 4 and 5.
4. Align and install composite marker light (Figure 3, Item 9) to platform and secure with two screws (Figure 3, Item 2) and locknuts (Figure 3, Item 1).
5. Refer to electrical schematic rear foldout Figure FO-1 for incandescent lights and reconnect four electrical connectors (Figure 3, Item 5) to W2 harness.



HETT0252

Figure 3. Composite Marker Light Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Reconnect intervehicular electrical cable, turn on tractor/semitrailer lights, and check composite marker light for proper operation (WP 0013).

END OF WORK PACKAGE

FIELD MAINTENANCE
VEHICULAR BAR LAMP

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Personnel Required

1

Materials/Parts

Rag, Wiping (WP 0170, Item 23)
Lockwasher (4)

Equipment Conditions

Semitrailer parked on level ground, parking brakes applied, and intervehicular cables disconnected (WP 0013)

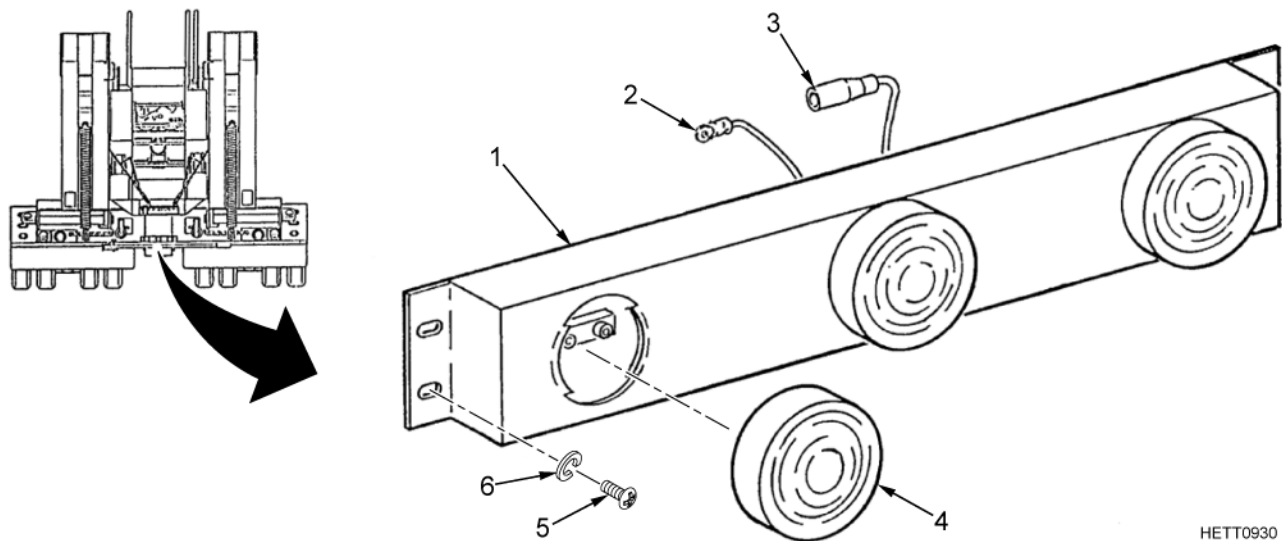
GENERAL INFORMATION

This work package contains instructions for removal and installation of the vehicular bar lamp.

REMOVAL**CAUTION**

Some semitrailers are equipped with LED vehicular bar lamps. These lamps are very similar in appearance to incandescent vehicular bar lamps but the marker clearance lights are not interchangeable. Substitution will cause damage to equipment.

1. Refer to electrical schematic rear foldout Figure FO-1 for incandescent lights, and tag and disconnect socket connector (Figure 1, Item 3) from W2 harness. Refer to electrical schematic rear foldout Figure FO-1.1 for LED lights. Tag and disconnect socket connector from W2 harness.
2. Locate mounting screw (Figure 1, Item 5) with terminal lug of white wire (Figure 1, Item 2) (ground) under head. Remove that screw and lockwasher (Figure 1, Item 6) from platform and tag white wire.
3. Remove remaining three screws (Figure 1, Item 5) and lockwashers (Figure 1, Item 6), and remove vehicular bar lamp (Figure 1, Item 1) from platform. Discard lockwashers.
4. Remove three marker clearance lights (Figure 1, Item 4) from bar lamp (Figure 1, Item 1) by turning and/or twisting marker clearance lights.
5. Inspect wires, terminal lug, and socket connectors for corrosion, frayed or broken wires, and looseness. If socket connectors or terminal lugs are defective, use electrical repair kit and replace as required. If wires are frayed or broken, replace vehicular bar lamp.
6. Inspect marker clearance light sockets for corrosion and defects. If corroded, clean sockets by wiping with a wiping rag. If sockets cannot be cleaned or if sockets are defective, replace vehicular bar lamp.
7. Inspect for burned out, missing, cracked, or nonsealing marker clearance lights. If defective, replace marker clearance lights.



HETT0930

Figure 1. Light Removal.

END OF TASK

INSTALLATION**NOTE**

If installing new vehicular bar lamp, the four mounting holes must be drilled out to 0.200 to 0.211 in. (0.508 to 0.535 cm) diameter.

1. Align and install, by turning and/or twisting, marker clearance lights (Figure 2, Item 4) onto vehicular bar lamp (Figure 2, Item 1).
2. Align and install vehicular bar lamp (Figure 2, Item 1) to platform. Secure bar lamp using three lockwashers (Figure 2, Item 6) and mounting screws (Figure 2, Item 5).
3. Reconnect terminal lug (Figure 2, Item 2) on white wire (ground) to platform using fourth lockwasher (Figure 2, Item 6) and mounting screw (Figure 2, Item 5). Before installing screw, ensure contact area is free of paint and/or corrosion.
4. Refer to electrical schematic rear foldout Figure FO-1 for incandescent lights, and reconnect socket connector (Figure 2, Item 3) to W2 harness. Refer to electrical schematic rear foldout Figure FO-1.1 for LED lights, and connect socket connector to W2 harness.

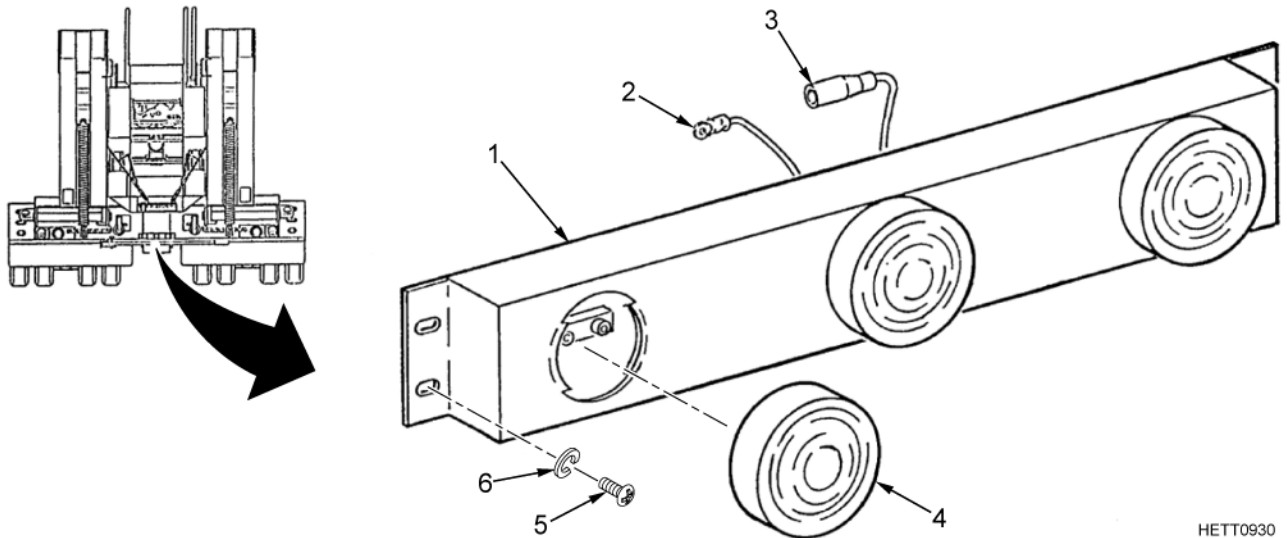


Figure 2. Light Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Reconnect intervehicular electrical cable (WP 0013), turn on tractor/semitrailer lights, and check vehicular bar lamp for proper operation.

END OF WORK PACKAGE

FIELD MAINTENANCE
STOPLIGHT/TAILLIGHT

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Locknut (3)

Personnel Required

1

Materials/Parts

Rag, Wiping (WP 0170, Item 23)
Sleeving, Electrical Insulation (WP 0170, Item 27)
Sleeving, Electrical Insulation (WP 0170, Item 28)

Equipment Conditions

Semitrailer parked on level ground, parking brakes applied, and intervehicular cables disconnected (WP 0013)

GENERAL INFORMATION

This work package contains instructions for removal, repair, and installation of the stoplight/taillight.

REMOVAL**NOTE**

- Use the following procedure for either the curbside or streetside stoplight/taillight. To repair or replace both lights, repeat this procedure as necessary.
 - Some semitrailers are equipped with one-piece LED stoplights/taillights. These lights have a removable three-lead electrical harness. The power lead is fitted with a plug connector, the ground lead is fitted with a lug terminal, and the third lead is capped (not used). These lights are not interchangeable with bulb-type stoplights.
1. Refer to electrical schematic rear foldout Figure FO-1 for incandescent lights or Figure FO-1.1 for LED lights. Tag and disconnect stoplight/taillight socket connector (Figure 1, Item 7) from W2 harness.
 2. For LED light, also disconnect ground lead (Figure 1, Item 4) from connector clip mount stud (Figure 1, Item 5). The two connector clips replace one large loop clamp on rear of platform, one on each side.
 3. Remove three locknuts (Figure 1, Item 3), clamp (Figure 1, Item 6), and three screws (Figure 1, Item 1), and remove stoplight/taillight (Figure 1, Item 2) from platform. Discard locknuts.
 4. For LED light, remove three-lead harness from socket on back of light. No other disassembly is authorized.

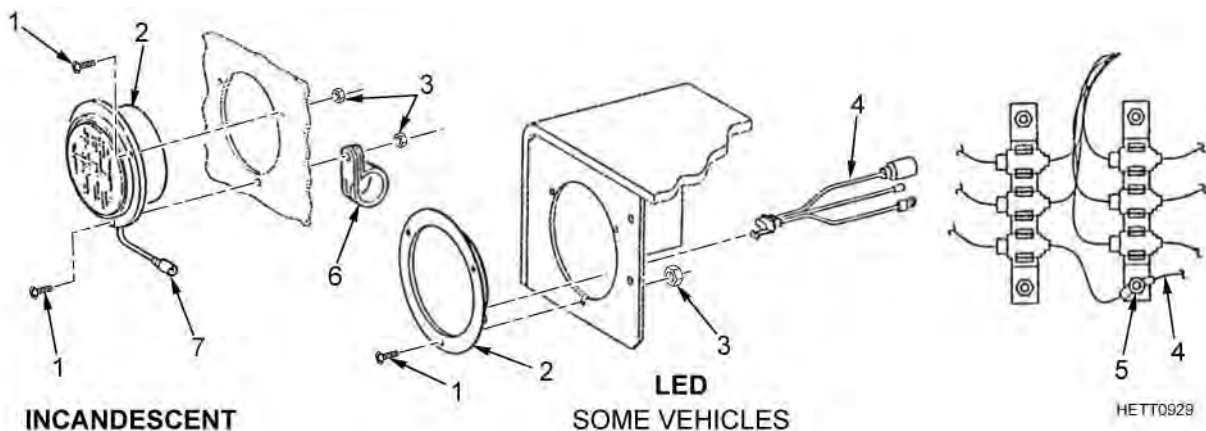


Figure 1. Stoplight/Taillight Removal.

END OF TASK

REPAIR

1. Remove retaining ring (Figure 2, Item 7) and light lens (Figure 2, Item 6) from stoplight/taillight (Figure 2, Item 2).
2. Remove bulb (Figure 2, Item 1) from stoplight/taillight (Figure 2, Item 2).
3. Inspect wire and socket connector (Figure 2, Item 5) for corrosion, frayed or broken wires, and looseness. If socket connector is defective, use electrical repair kit and replace as required. If wire is frayed or broken, replace stoplight/taillight. Use two layers of shrinkable sleeve insulation to form a seal between connector shell and stoplight lead.
4. For LED light, if wires (Figure 2, Item 3) are frayed, replace three-lead harness. Check connector clip mount stud (Figure 2, Item 4) for corrosion, and clean, repair, or replace as needed.
5. Inspect bulb socket for corrosion and defects. If corroded, clean bulb socket by wiping with a wiping rag. If socket cannot be cleaned or if socket is defective, replace stoplight/taillight.
6. For LED light, inspect for cracks and/or defective LED. If light is defective, or more than 25 percent of LEDs do not emit light, replace one-piece stoplight/taillight.
7. Inspect for burned out bulb (Figure 2, Item 1). If defective, replace bulb.
8. Inspect for missing, cracked, or non-sealing light lens (Figure 2, Item 6). If light lens is defective, replace lens. If retainer ring (Figure 2, Item 7) is defective, replace stoplight/taillight.

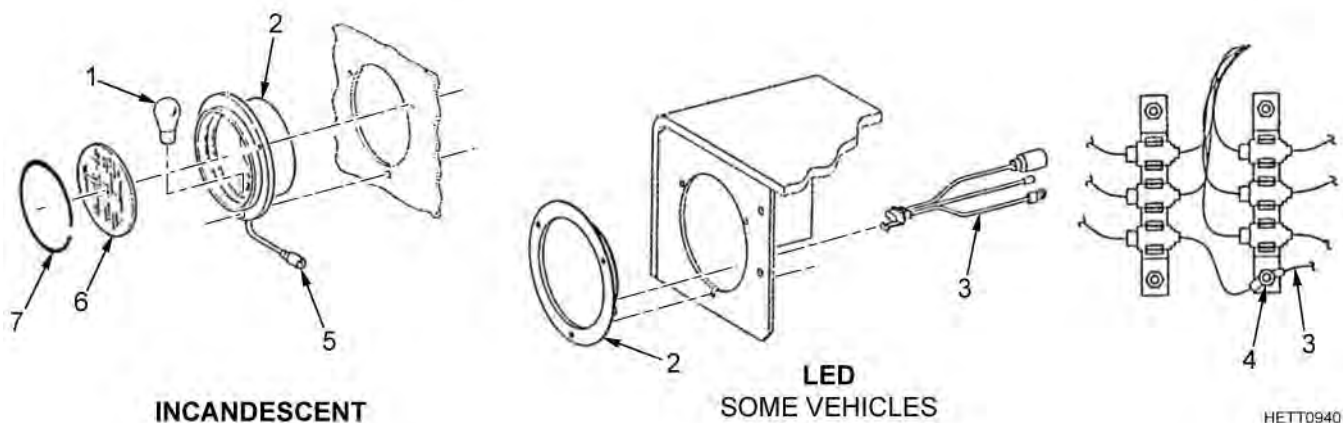


Figure 2. Stoplight/Taillight Repair.

END OF TASK

INSTALLATION**NOTE**

Some semitrailers are equipped with one-piece LED stoplights/taillights. These lights have a removable three-lead electrical harness. The power lead is fitted with a plug connector, the ground lead is fitted with a lug terminal, and the third lead is capped (not used). These lights are not interchangeable with bulb-type stoplights.

1. Install bulb (Figure 3, Item 1) into stoplight/taillight (Figure 3, Item 3).
2. For LED light, install three-lead harness to socket on back of light. No other assembly is authorized.
3. Install light lens (Figure 3, Item 9) and retaining ring (Figure 3, Item 10) into stoplight/taillight (Figure 3, Item 3).
4. Align and install stoplight/taillight (Figure 3, Item 3) to platform. Secure in place with three screws (Figure 3, Item 2), clamp (Figure 3, Item 7), and three locknuts (Figure 3, Item 4).
5. Refer to electrical schematic rear foldout Figure FO-1.1 for LED lights. Reconnect wire with connector to W2 harness, and connect ground lead (Figure 3, Item 5) to connector clip mount stud (Figure 3, Item 6). If necessary, secure capped wire with wire tie. The two connector clips replace one large loop clamp on rear of platform, one on each side.
6. Refer to electrical schematic rear foldout Figure FO-1 for incandescent lights or for LED lights Figure FO-1.1, and reconnect stoplight/taillight socket connector (Figure 3, Item 8) to W2 harness.

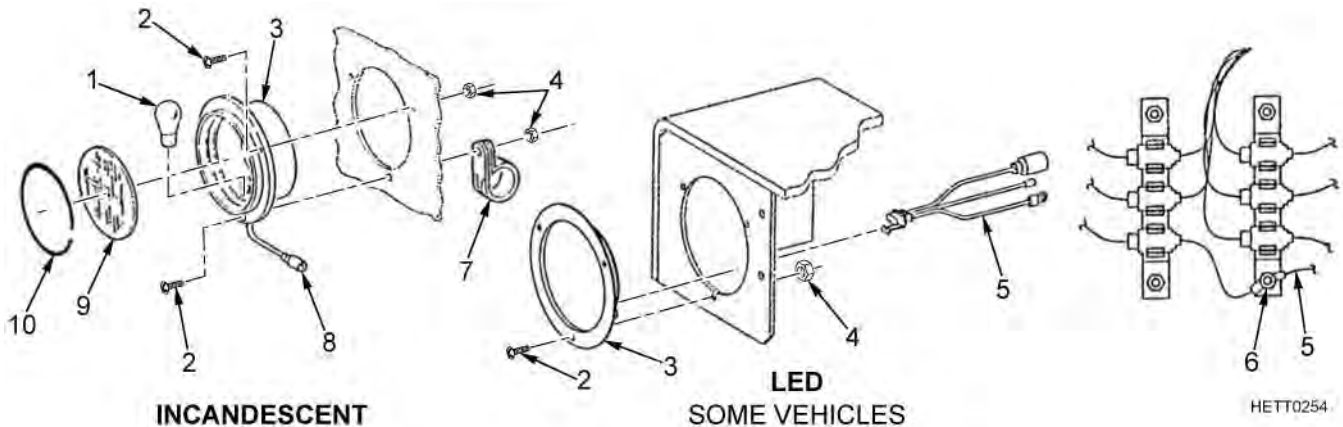


Figure 3. Stoplight/Taillight Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Reconnect intervehicular electrical cable and check stoplight/taillight for proper operation (WP 0013).

END OF WORK PACKAGE

FIELD MAINTENANCE
CLEARANCE LIGHT/BLACKOUT LIGHT

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (WP 0168, Item 11)

Personnel Required

1

Materials/Parts

Preformed Felt (1)

Locknut (4)

Lockwasher (1)

Lockwasher (1)

Equipment Conditions

Semitrailer parked on level ground, parking brakes applied, and intervehicular cables disconnected (WP 0013)

GENERAL INFORMATION

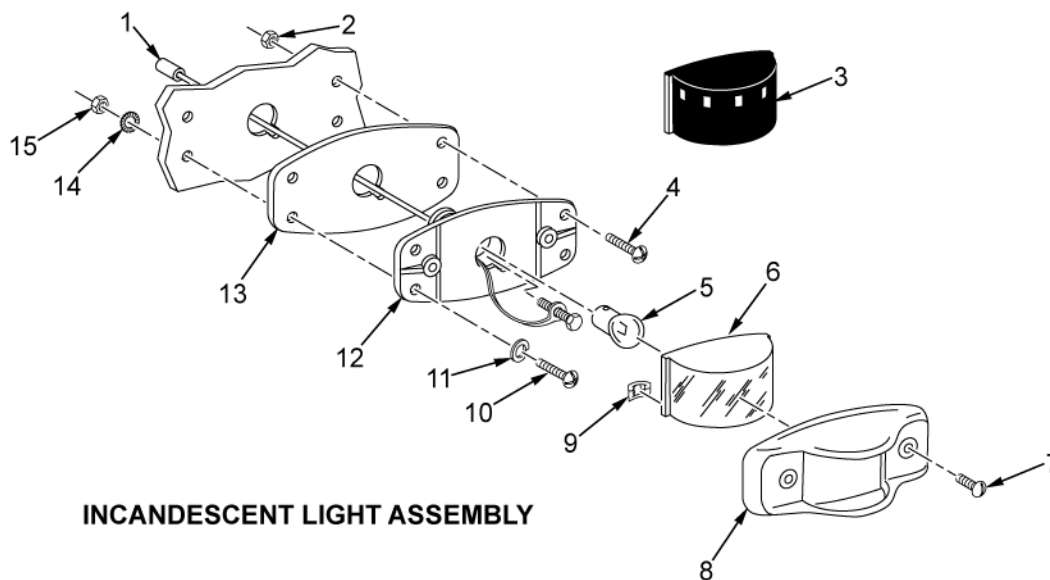
This work package contains instructions for disassembly, inspection, and assembly of the clearance light/blackout light.

REMOVAL

Incandescent Light Assembly

NOTE

- Use the following procedure for all clearance lights located on either the curbside or streetside of the platform. To repair or replace all clearance lights, repeat this procedure as necessary.
 - If semitrailer is equipped with LED clearance lights, there are differences between clearance lights and blackout lights. Both are addressed in this procedure.
1. Refer to electrical schematic Figure FO-1 for incandescent lights. Tag and disconnect clearance light socket connector (Figure 1, Item 1) from platform wiring harness. Proceed to steps 2 through 5.
 2. Remove two screws (Figure 1, Item 7) and retainer lens (Figure 1, Item 3 or Item 6) from lamp holder mounting plate (Figure 1, Item 12).
 3. Remove three locknuts (Figure 1, Item 2) and three screws (Figure 1, Item 4) from lamp holder mounting plate (Figure 1, Item 12). Remove locknut (Figure 1, Item 15), external tooth lockwasher (Figure 1, Item 14), screw (Figure 1, Item 10), lockwasher (Figure 1, Item 11), preformed felt (Figure 1, Item 13), and lamp holder mounting plate from platform. Discard locknuts, lockwashers, and preformed felt.
 4. Remove two push-on nuts (Figure 1, Item 9) and separate light lens (Figure 1, Item 3 or Item 6) from lens retainer bracket (Figure 1, Item 8).
 5. Remove bulb (Figure 1, Item 5) from lamp holder mounting plate (Figure 1, Item 12). Loosen screw on lamp holder mounting plate and allow to hang loose.



INCANDESCENT LIGHT ASSEMBLY

HETT0255

Figure 1. Incandescent Light Assembly Removal.

LED Light Assembly

1. For LED blackout light, remove two screws (Figure 2, Item 12), lens (Figure 2, Item 16) and lens retainer bracket (Figure 2, Item 15). For LED clearance light, remove two screws and lens retainer bracket (Figure 2, Item 1).
2. For LED clearance light, remove LED element (Figure 2, Item 2) by turning clockwise and pulling out; then, disconnect LED lead (Figure 2, Item 5) from base of LED element and connector (Figure 2, Item 7). For LED blackout light, remove LED element (Figure 2, Item 17) from lamp holder mounting plate (Figure 2, Item 11).
3. Remove three locknuts (Figure 2, Item 8), screws (Figure 2, Item 3), locknut (Figure 2, Item 9), external tooth lockwasher (Figure 2, Item 10), screw (Figure 2, Item 13), lockwasher (Figure 2, Item 14), preformed felt (Figure 2, Item 6), and lamp holder mounting plate (Figure 2, Item 4 or Item 11) from platform. Discard locknuts, lockwashers, and preformed felt.

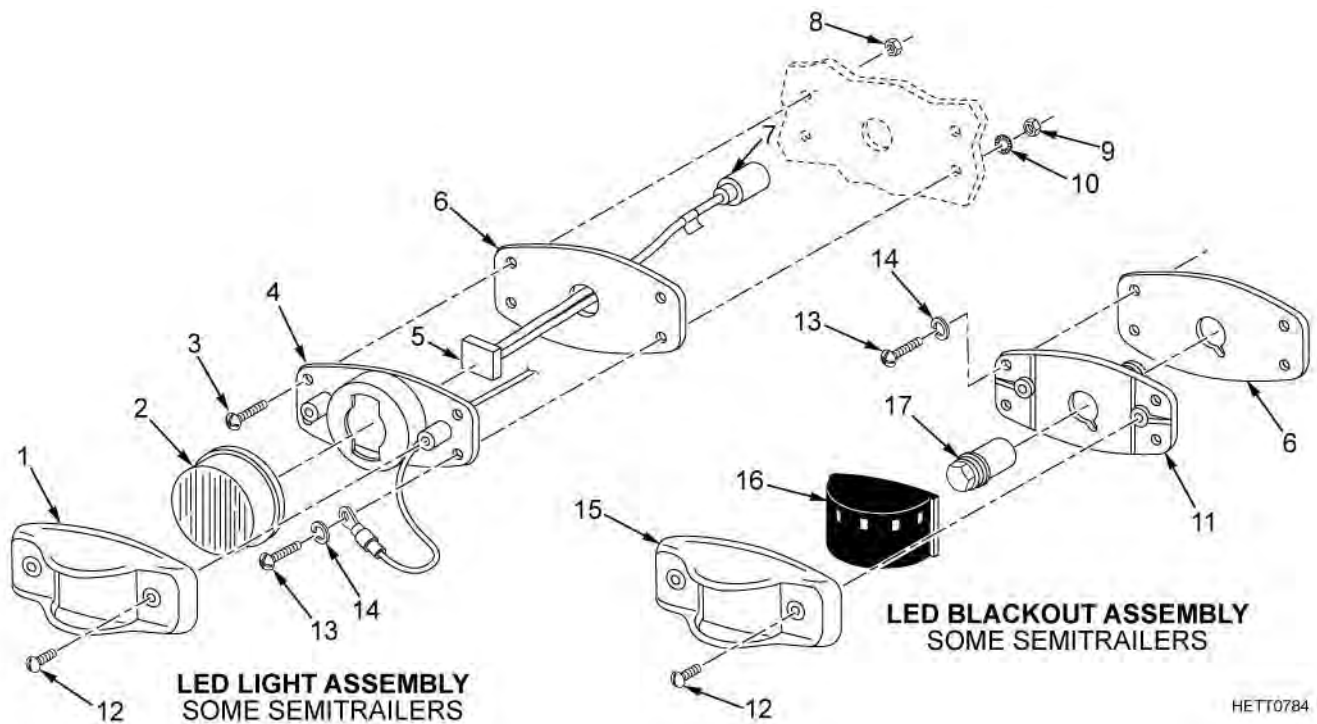


Figure 2. LED Light Assembly.

END OF TASK

REPAIR

1. Inspect wire and socket connector for corrosion, frayed or broken wires, and looseness. If defects exist, replace clearance light assembly.
2. Inspect for missing, cracked, or non-sealing lens retainer, mounting plate, or lens. If defective, replace clearance light assembly.
3. Inspect bulb socket (element socket for LED blackout light) for corrosion and defects. If socket cannot be cleaned or socket is defective, replace clearance light assembly.
4. For LED clearance light, inspect connector for corrosion and defects.

END OF TASK**INSTALLATION****NOTE**

For LED clearance light, disregard steps 1, 2, 4, and 7.

1. Install bulb (Figure 3, Item 17) to lamp holder mounting plate (Figure 3, Item 5). Install screw (Figure 3, Item 4) on lamp holder mounting plate.
2. For LED blackout light, install LED element (Figure 3, Item 13) to lamp holder mounting plate (Figure 3, Item 5).
3. For LED clearance light, connect LED lead (Figure 3, Item 15) to LED element (Figure 3, Item 14). Install LED element into lamp holder mounting plate (Figure 3, Item 5) and turn counterclockwise.
4. Align light lens (Figure 3, Item 3) to lens retainer bracket (Figure 3, Item 2) and secure with two push-on nuts (Figure 3, Item 16).
5. Align and install lamp holder mounting plate (Figure 3, Item 5) and preformed felt (Figure 3, Item 6) to platform. Secure with three screws (Figure 3, Item 4), three locknuts (Figure 3, Item 7), screw (Figure 3, Item 12), lockwasher (Figure 3, Item 11), external tooth lockwasher (Figure 3, Item 10), and locknut (Figure 3, Item 9).
6. For LED clearance light, ensure that ground lead terminal lug (Figure 3, Item 19) is under head of screw (Figure 3, Item 18) with lockwasher (Figure 3, Item 10).
7. Install lens retainer bracket (Figure 3, Item 2) to lamp holder mounting plate (Figure 3, Item 5) and secure with two screws (Figure 3, Item 1).
8. For LED clearance light, install lens retainer bracket (Figure 3, Item 2) to lamp holder mounting plate (Figure 3, Item 5) and secure with two screws (Figure 3, Item 1).
9. Reconnect clearance light socket connector (Figure 3, Item 8) to platform wiring harness.

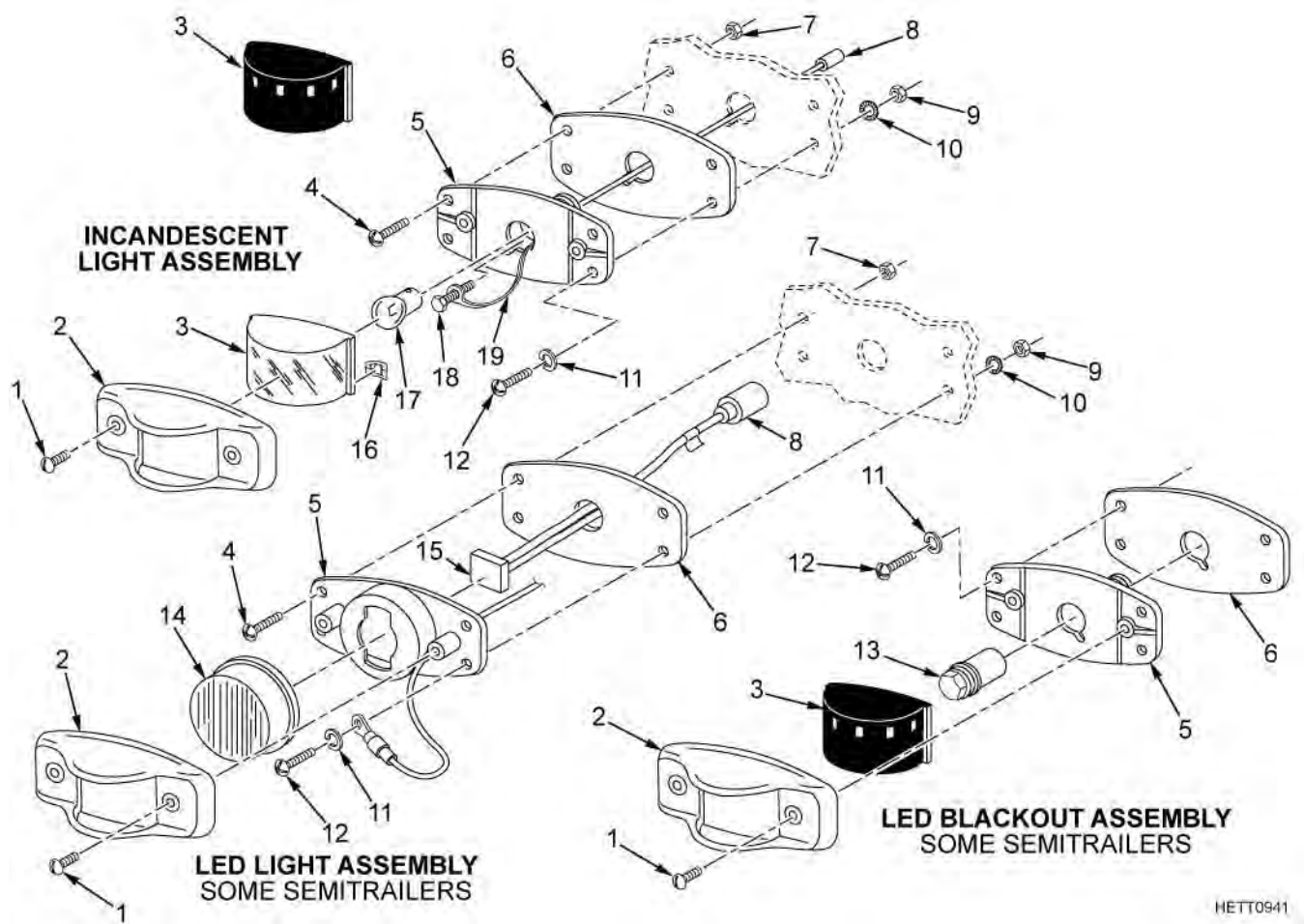


Figure 3. Incandescent and LED Light Assembly Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Reconnect intervehicular electrical cable (WP 0013) and check clearance and blackout lights for proper operation.

END OF WORK PACKAGE

FIELD MAINTENANCE

STEERING PRESSURE INDICATOR LIGHT

INITIAL SETUP:

Tools and Special Tools

- General Mechanic's Tool Kit (WP 0168, Item 11)
- Standard Army Tool Set (WP 0168, Item 28)

Personnel Required

2

Materials/Parts

- Sleeving, Electrical Insulation (WP 0170, Item 26)
- Strap, Tiedown (as required) (WP 0170, Item 33)
- Preformed Packing (1)
- Lockwasher (6)

Equipment Conditions

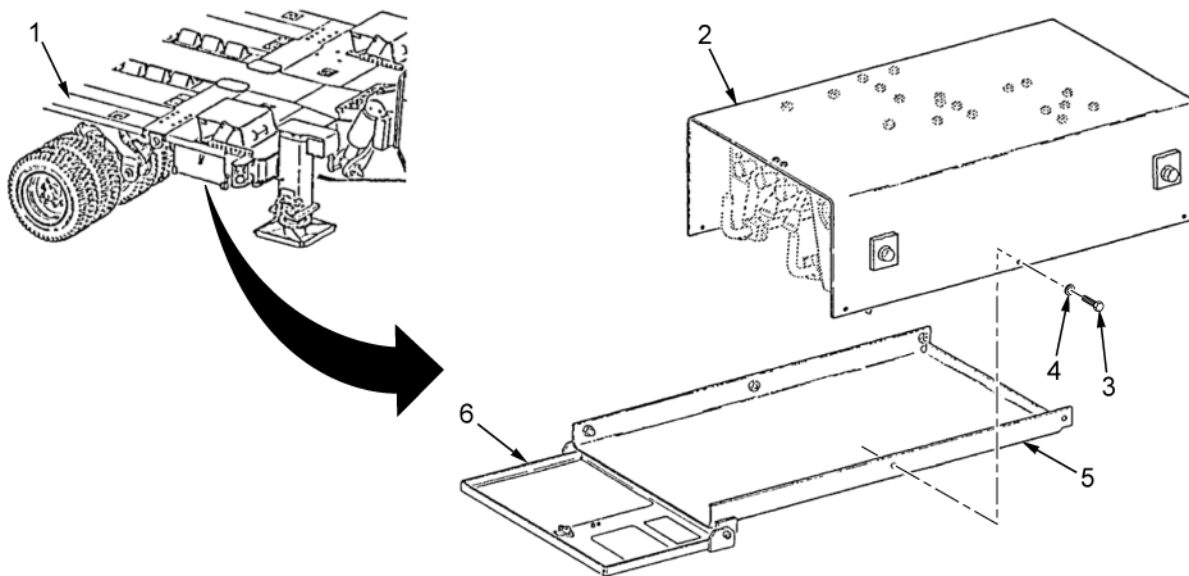
Semitrailer parked on level ground, wheels chocked, parking brakes applied, and intervehicular cables disconnected (WP 0013)

GENERAL INFORMATION

This work package contains instructions for removal and installation of the steering pressure indicator light.

REMOVAL

1. Ensure hydraulic control module access cover (Figure 1, Item 6) is lowered (WP 0004).
2. Use two people to remove six capscrews (Figure 1, Item 3), lockwashers (Figure 1, Item 4), and lower panel (Figure 1, Item 5) from hydraulic control module (Figure 1, Item 2). Carefully remove lower panel, with access cover (Figure 1, Item 6) attached, out from under semitrailer and place on platform (Figure 1, Item 1). Discard lockwashers.



HETT0496

Figure 1. Access Cover Removal.

CAUTION

When cutting tiedown straps and sliding steering pressure indicator light out to expose solder connections, use caution so that wires do not get cut, caught, or pulled on the frame or damage to equipment may result.

3. Remove nut (Figure 2, Item 4) and lockwasher (Figure 2, Item 5) from heat shrink tube (Figure 2, Item 3). Carefully cut and remove tiedown straps (Figure 2, Item 1) as required and slide steering pressure indicator light (Figure 2, Item 10) out and away from hydraulic control module gauge panel (Figure 2, Item 2). Move steering pressure indicator light only enough to expose soldered contact points. Discard tiedown straps.

WARNING



Soldering fumes are toxic. Avoid breathing these fumes. Work in a well-ventilated area. Failure to follow this warning may result in injury to personnel.

CAUTION

Rosin core solder contains flux, which is corrosive. All soldered connections must be cleaned of all flux residue or damage to equipment may result.

4. Cut and remove heat shrink tubing (Figure 2, Item 3) on wire leads to steering pressure indicator light (Figure 2, Item 10). Refer to electrical schematic rear foldout Figure FO-1 for incandescent lights. Tag and unsolder jumper wires from steering pressure indicator light (Figure 2, Item 10).
5. Remove lens (Figure 2, Item 9). Remove incandescent lamp (Figure 2, Item 8) and preformed packing (Figure 2, Item 7) from indicator base (Figure 2, Item 6). Discard preformed packing.

WARNING



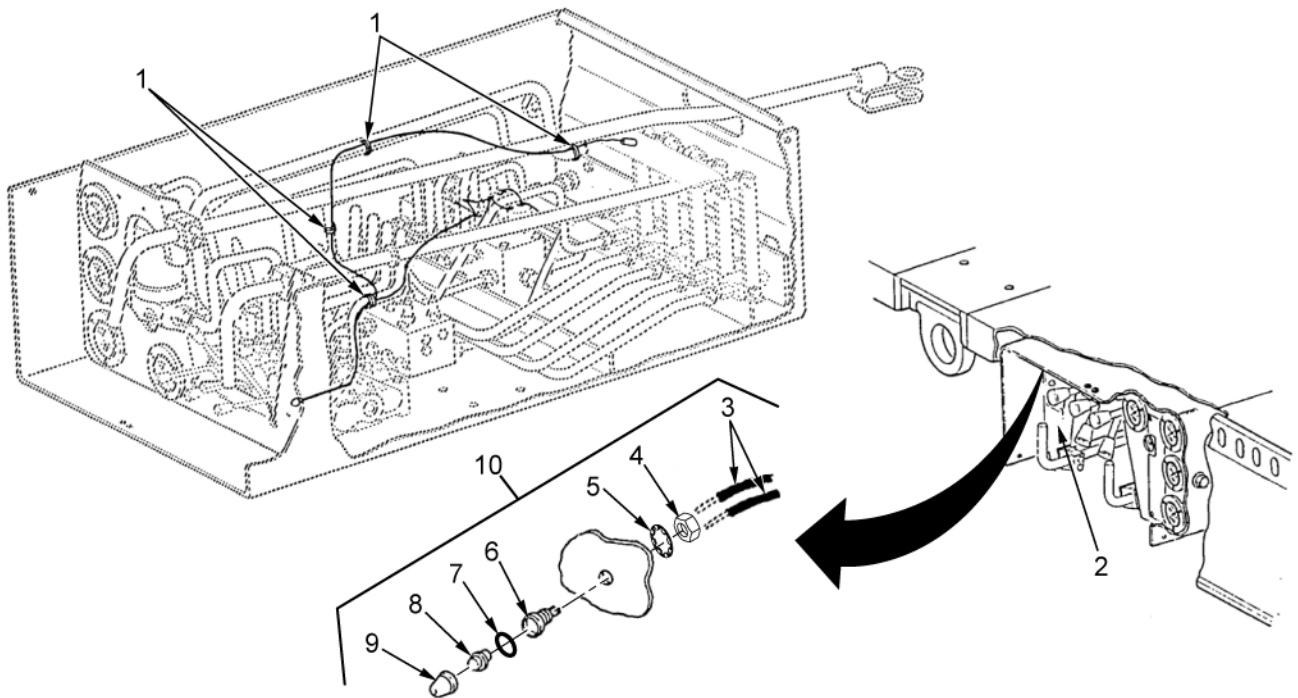
Soldering fumes are toxic. Avoid breathing these fumes. Work in a well-ventilated area. Failure to follow this warning may result in injury to personnel.

CAUTION

Rosin core solder contains flux, which is corrosive. All soldered connections must be cleaned of all flux residue or damage to equipment may result.

6. Inspect bulb socket for bad solder connections, corrosion, and defects. If corroded, clean bulb socket by wiping with a wiping rag. If a bad solder exists, resolder. If bulb socket cannot be cleaned or socket is defective, replace steering pressure indicator light assembly.

7. Inspect steering indicator light wires and terminals for corrosion, looseness, and frayed or broken wires. If wires or terminals are defective or loose, refer to step 4 of this procedure.
8. Inspect for burned out incandescent bulbs. If bulbs are burned out, replace as necessary.
9. Inspect for defective bulb sockets or lens. If found defective, replace steering pressure indicator light assembly.



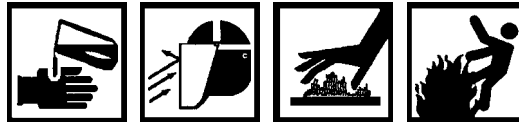
HETT0931

Figure 2. Steering Pressure Indicator Light Removal.

END OF TASK

INSTALLATION

1. Install new preformed packing (Figure 3, Item 7), incandescent lamp (Figure 3, Item 8), and lens (Figure 3, Item 9) to indicator base (Figure 3, Item 6).
2. Pass jumper wires through nut (Figure 3, Item 4), lockwasher (Figure 3, Item 5), and opening in hydraulic control module gauge panel (Figure 3, Item 2). Install heat shrink electrical insulation (Figure 3, Item 3) onto jumper wires.

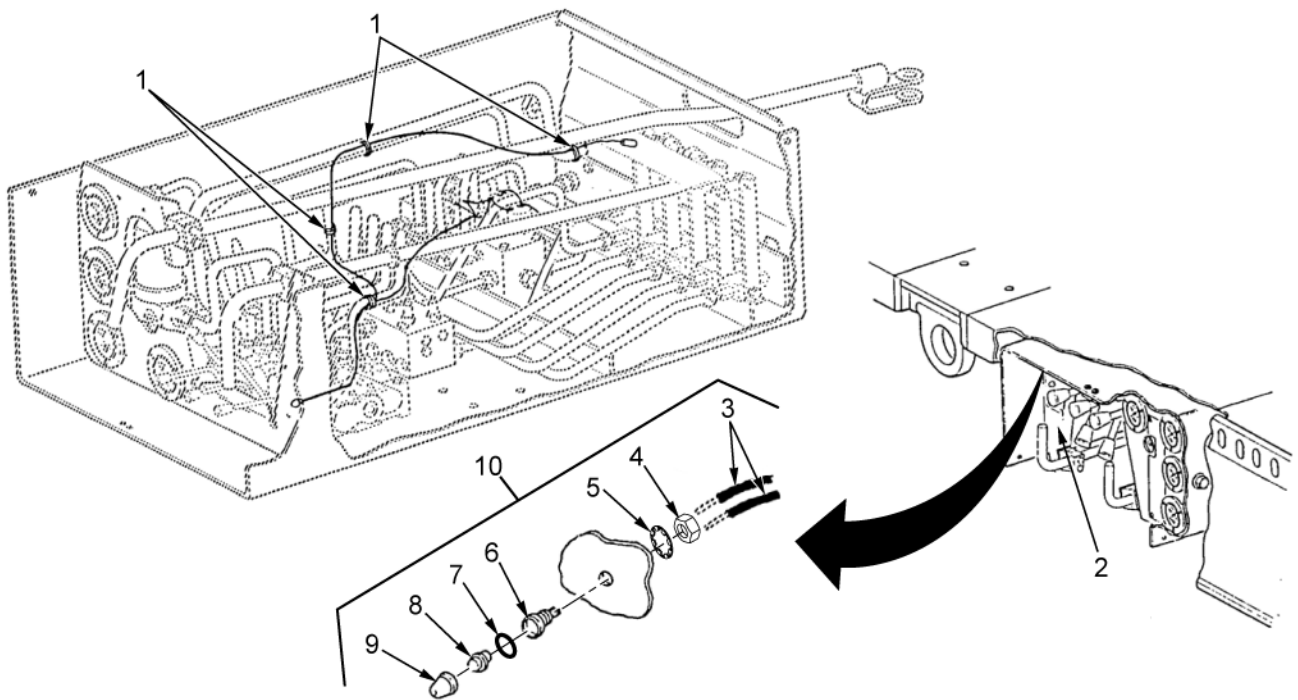
WARNING

Soldering fumes are toxic. Avoid breathing these fumes. Work in a well-ventilated area. Failure to follow this warning may result in injury to personnel.

CAUTION

Rosin core solder contains flux, which is corrosive. All soldered connections must be cleaned of all flux residue or damage to equipment may result.

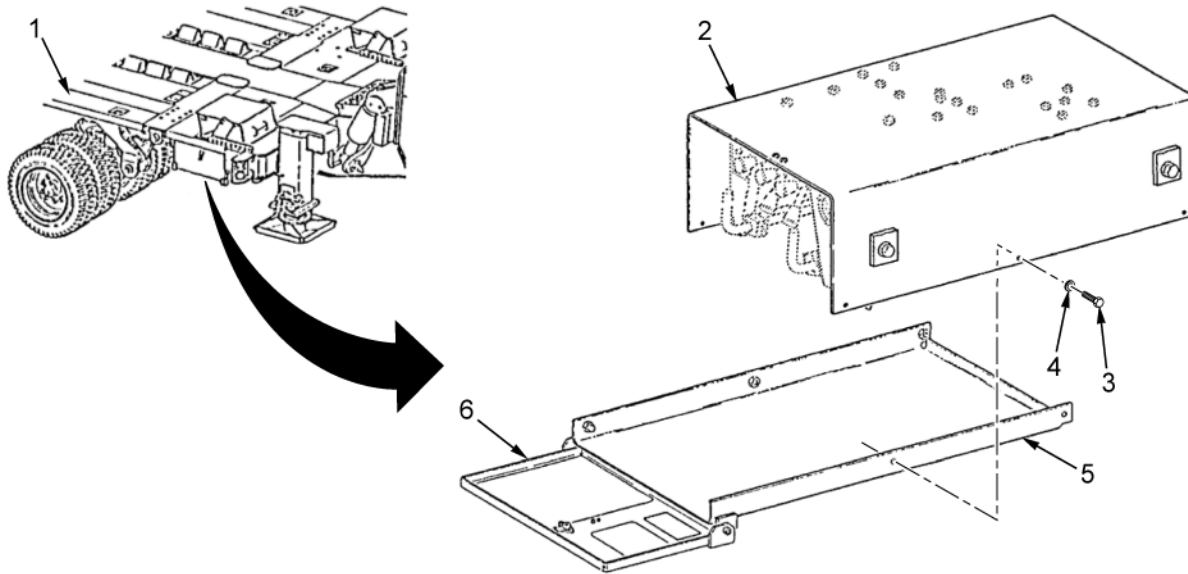
3. Refer to electrical schematic rear foldout Figure FO-1 for incandescent lights. Align jumper wires with steering pressure indicator light (Figure 3, Item 10) and, using soldering gun, solder two leads to steering pressure indicator light. Using soldering torch kit, shrink heat shrink electrical insulation (Figure 3, Item 3) over soldered joint.
4. Insert steering pressure indicator light (Figure 3, Item 10) into hydraulic control module gauge panel (Figure 3, Item 2). Secure panel in place by installing and tightening nut (Figure 3, Item 4).
5. Install new tiedown straps (Figure 3, Item 1) as required.



HETT0257

Figure 3. Assembly.

6. Use two people to carefully position lower panel (Figure 4, Item 5), with access cover attached (Figure 4, Item 6), over hydraulic control module (Figure 4, Item 2) on underside of semitrailer (Figure 4, Item 1). Secure lower panel with six lockwashers (Figure 4, Item 4) and six capscrews (Figure 4, Item 3).



HETT0496

Figure 4. Follow-On Maintenance.

END OF TASK

FOLLOW-ON MAINTENANCE

Start Auxiliary Power Unit (APU) (WP 0005).

Reconnect intervehicular electrical cable (WP 0013) and check steering pressure indicator light while manually adjusting steering (WP 0010).

END OF WORK PACKAGE

FIELD MAINTENANCE**INDICATOR LIGHTS - OIL PRESSURE AND GLOW PLUG**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Personnel Required

1

Materials/Parts

Sleeving, Electrical Insulation (WP 0170, Item 26)
Solder (WP 0170, Item 30)
Strap, Tiedown (as required) (WP 0170, Item 33)
Preformed Packing (1)
Lockwasher (4)

Equipment Conditions

Semitrailer parked on level ground, wheels chocked,
parking brakes applied, and intervehicular cables
disconnected (WP 0013)
Negative lead from battery disconnected (WP 0051)

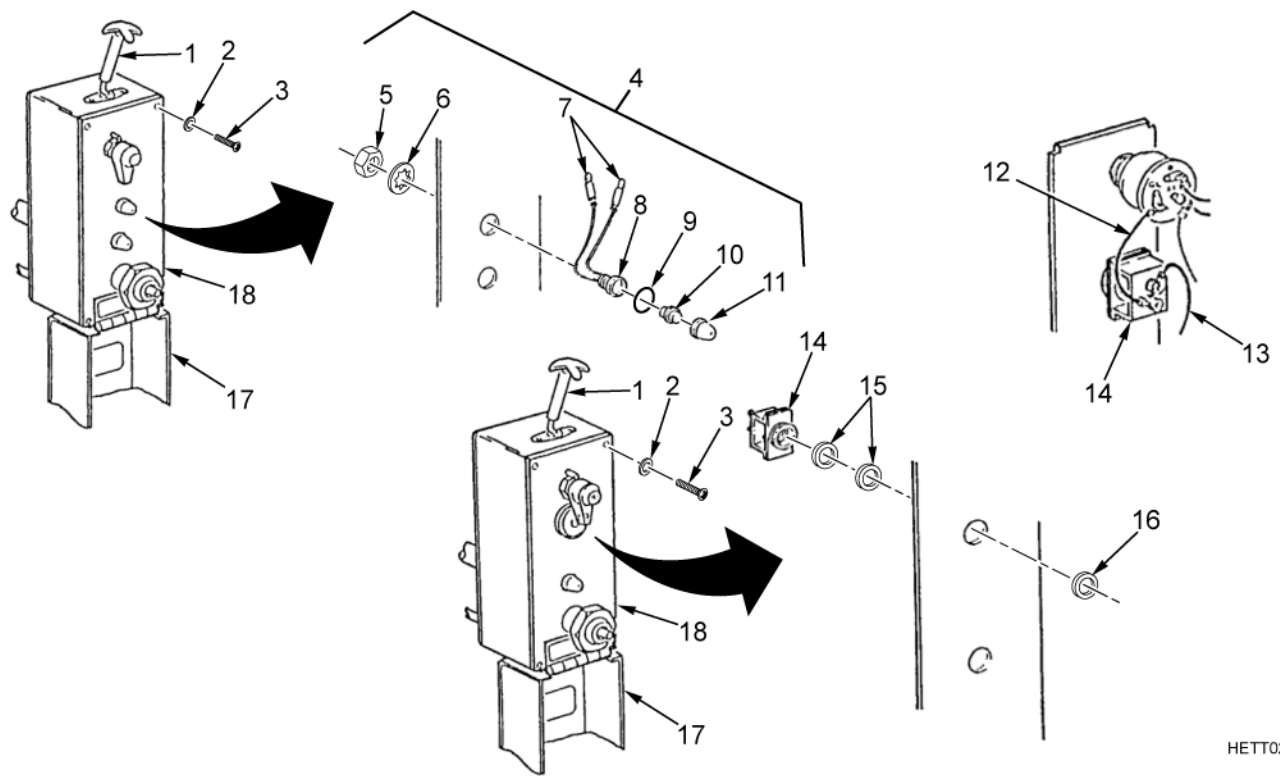
GENERAL INFORMATION

This work package contains instructions for the removal, inspection, and installation of the indicator lights - oil pressure and glow plug.

REMOVAL**NOTE**

On Auxiliary Power Unit (APU) with APU engine serial number 504697 and subsequent numbers, the glow plug indicator is changed from a glow-type indicator to a lamp driven by a timer.

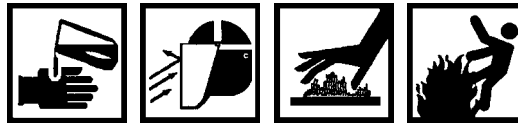
1. Open cover to APU control box by lifting up retainer (Figure 1, Item 1) and lowering cover weldment (Figure 1, Item 17).
2. Remove four screws (Figure 1, Item 3), lockwashers (Figure 1, Item 2), and access plate (Figure 1, Item 18) from APU control box. Discard lockwashers.
3. Refer to APU electrical schematic rear foldout Figure FO-4 and proceed as follows:
 - a. For lamp-type indicator:
 - (1) Tag and disconnect APU wiring harness leads from two quick-disconnect terminals (Figure 1, Item 7) on indicator light (Figure 1, Item 4).
 - (2) Remove nut (Figure 1, Item 5), lockwasher (Figure 1, Item 6), and indicator light (Figure 1, Item 4) from access plate (Figure 1, Item 18). Discard lockwasher.
 - (3) Remove lens (Figure 1, Item 11). Remove incandescent lamp (Figure 1, Item 10) and preformed packing (Figure 1, Item 9) from indicator base (Figure 1, Item 8). Discard preformed packing.
 - b. For glow-type glow plug indicators:
 - (1) Tag and disconnect jumper wire (Figure 1, Item 12) and APU cable assembly (Figure 1, Item 13) from back of glow plug indicator (Figure 1, Item 14).
 - (2) Unscrew and remove retainer ring (Figure 1, Item 16), two washers (Figure 1, Item 15), and glow plug indicator (Figure 1, Item 14) from access plate (Figure 1, Item 18).



HETT0259

Figure 1. Lamp-Type and Glow-Type Indicator Removal.

END OF TASK

INSPECTION**WARNING**

Soldering fumes are toxic. Avoid breathing these fumes. Work in a well-ventilated area or injury to personnel may result.

CAUTION

Rosin core solder contains flux, which is corrosive. All soldered connections must be cleaned of all flux residue or damage to equipment may result.

NOTE

This inspection procedure is valid only for lamp-type glow plug indicators.

1. Inspect indicator (bulb) socket (Figure 2, Item 3) for bad solder connections, corrosion, and defects. If corroded, clean indicator (bulb) socket by wiping with a wiping rag. If a bad solder exists, resolder. If bulb socket cannot be cleaned or socket is defective, replace indicator light assembly.
2. Inspect indicator light wires (Figure 2, Item 1) and quick-disconnect terminals (Figure 1, Item 2) for corrosion, looseness, and frayed or broken wires. If wires or terminals are defective or loose, refer to steps 5 thru 9 of this procedure.
3. Inspect for burned out incandescent bulbs (Figure 2, Item 4). If bulbs are burned out, replace as necessary.
4. Inspect for defective indicator (bulb) sockets (Figure 2, Item 3) or lens (Figure 2, Item 5). If found defective, replace indicator light assembly.

WARNING

Soldering fumes are toxic. Avoid breathing these fumes. Work in a well-ventilated area or injury to personnel may result.

CAUTION

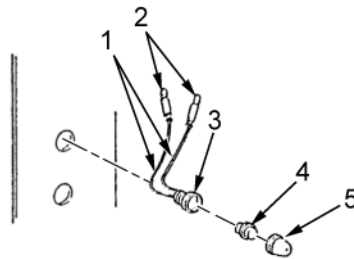
Rosin core solder contains flux, which is corrosive. All soldered connections must be cleaned of all flux residue or damage to equipment may result.

NOTE

This inspection procedure is valid only for lamp-type glow plug indicators.

5. Use soldering gun to unsolder and remove two wires (Figure 2, Item 1) from indicator (bulb) base (Figure 2, Item 3).
6. Refer to WP 0164. Use electrical repair kit and measuring tape to fabricate new wire(s) (Figure 2, Item 1) as required.
7. Use wire stripper to strip fabricated wires (Figure 2, Item 1) to designated length and allow for terminals (Figure 2, Item 2) to be installed or wires to be soldered.
8. Use electrical repair kit to crimp two quick-disconnect terminals (Figure 2, Item 2) onto wires (Figure 2, Item 1). Install heat shrink tubing onto two wires.

9. Use soldering gun to solder wires to indicator (bulb) base (Figure 2, Item 3). Clean all flux residue from solder joint. Use soldering torch kit to shrink heat shrink tubing over soldered joint.



HETT0934

Figure 2. Lamp-Type Glow Plug Indicator Inspection.

END OF TASK

INSTALLATION**NOTE**

On APU with APU engine serial number 504697 and subsequent numbers, the glow plug indicator is changed from a glow-type indicator to a lamp driven by a timer.

1. For lamp-type indicators:
 - a. Install preformed packing (Figure 3, Item 9), incandescent lamp (Figure 3, Item 10), and lens (Figure 3, Item 11) to indicator base (Figure 3, Item 8).
 - b. Pass two wires through access plate (Figure 3, Item 18) and install indicator light (Figure 3, Item 4) onto access plate (Figure 3, Item 18).
 - c. Pass two wires through lockwasher (Figure 3, Item 6) and nut (Figure 3, Item 5). Secure indicator light (Figure 3, Item 4) to access plate (Figure 3, Item 18) by tightening nut (Figure 3, Item 5).
 - d. Refer to APU electrical schematic rear foldout Figure FO-4. Reconnect APU wiring harness to two quick-disconnect terminals (Figure 3, Item 7) on indicator light (Figure 3, Item 4).
2. For glow-type indicators:
 - a. Install glow-plug indicator (Figure 3, Item 14) and two washers (Figure 3, Item 15) onto access plate (Figure 3, Item 18) and secure with retaining ring (Figure 3, Item 16).
 - b. Refer to APU electrical schematic rear foldout Figure FO-4. Reconnect APU cable assembly (Figure 3, Item 13) and jumper wire (Figure 3, Item 12) to back of glow plug indicator (Figure 3, Item 14).
3. Align and install access plate (Figure 3, Item 18) to APU control box and secure with four screws (Figure 3, Item 3) and lockwashers (Figure 3, Item 2).
4. Raise cover weldment (Figure 3, Item 17) and secure to APU control box by rehooking retainer (Figure 3, Item 1) to cover.

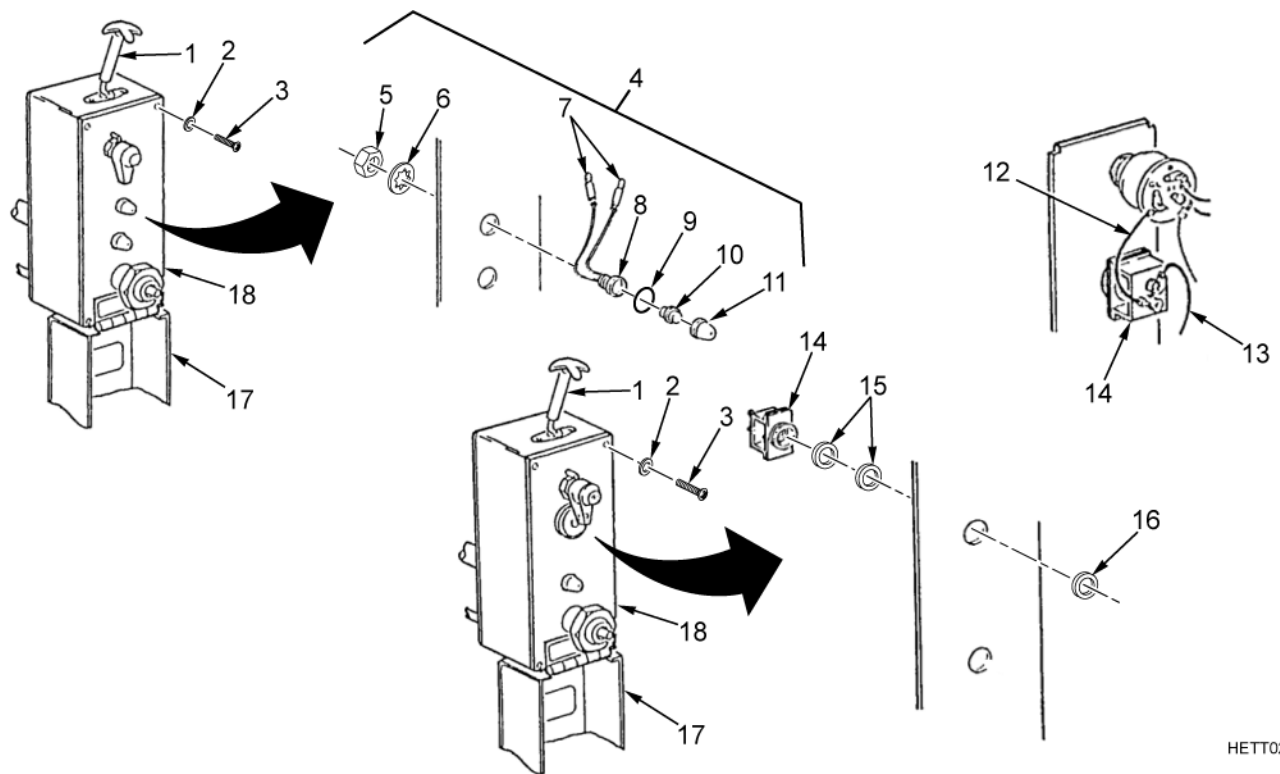


Figure 3. Lamp-Type and Glow-Type Indicator Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start APU (WP 0005) and check indicator lights.

END OF WORK PACKAGE

FIELD MAINTENANCE
BATTERY INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Personnel Required

1

References

TM 9-6140-200-14

Materials/Parts

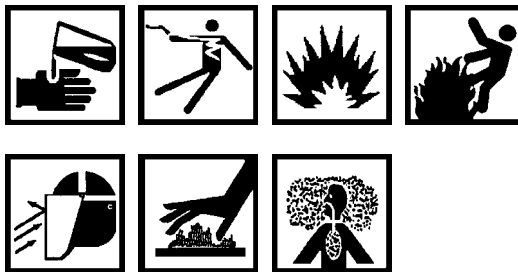
Petroleum Jelly (WP 0170, Item 21)
Sodium Bicarbonate (WP 0170, Item 29)
Water, Battery (WP 0170, Item 38)
Locknut (2)

Equipment Conditions

Gooseneck adjusted to approximately 64 in. (162.5 cm)
height (WP 0011) or coupled to tractor (WP 0013)

GENERAL INFORMATION

This work package contains instructions for the removal, inspection, and installation of the battery.

REMOVAL**WARNING**

- Storage batteries contain sulfuric acid, which will cause severe eye injury, skin burns, and damage to clothing. Wear eye protection and protective clothing and avoid spilling any acid. If contact occurs, flush affected areas immediately with large quantities of water and seek medical attention.
- Storage batteries give off hydrogen gas, which is extremely explosive. Keep all open flames, sparks, and smoking materials away from batteries or serious personal injury may result.
- Always disconnect negative (-) cable first and connect negative (-) cable last or serious injury may result.
- A frozen or completely discharged battery can explode if power is applied. Before connecting any form of external power to battery, ensure frozen battery is warmed or discharged battery is replaced or injury to personnel may result.
- On some semitrailers a solar battery charger is mounted to top of gooseneck directly in front of spare tires. Persons working on top of gooseneck must take **EXTREME** care not to step on it or trip over it. Injury to personnel or damage to equipment may result.

Failure to follow these warnings may result in injury to personnel.

1. Unhook two fasteners (Figure 1, Item 14) and raise and remove stair (Figure 1, Item 1) to gain access to battery (Figure 1, Item 9).

CAUTION

Some semitrailers have solar battery charger leads connected to negative and positive battery terminals. Ensure these leads are not damaged when disconnecting terminals from battery posts.

2. Disconnect negative (-) terminal (Figure 1, Item 3) from negative (-) post (Figure 1, Item 2) on battery (Figure 1, Item 9). Disconnect positive (+) terminal (Figure 1, Item 7) from positive (+) post (Figure 1, Item 8) on battery. If equipped, DO NOT damage solar leads (Figure 1, Item 13) from W5 harness (Figure 1, Item 12) to battery terminals when disconnecting/connecting from battery posts.
3. Remove two locknuts (Figure 1, Item 4), washers (Figure 1, Item 5), and hold-down bracket (Figure 1, Item 6) from battery (Figure 1, Item 9). Discard locknuts.
4. Use battery carrier, if necessary, to lift battery (Figure 1, Item 9) from frame (Figure 1, Item 11) and remove two bolts (Figure 1, Item 10).

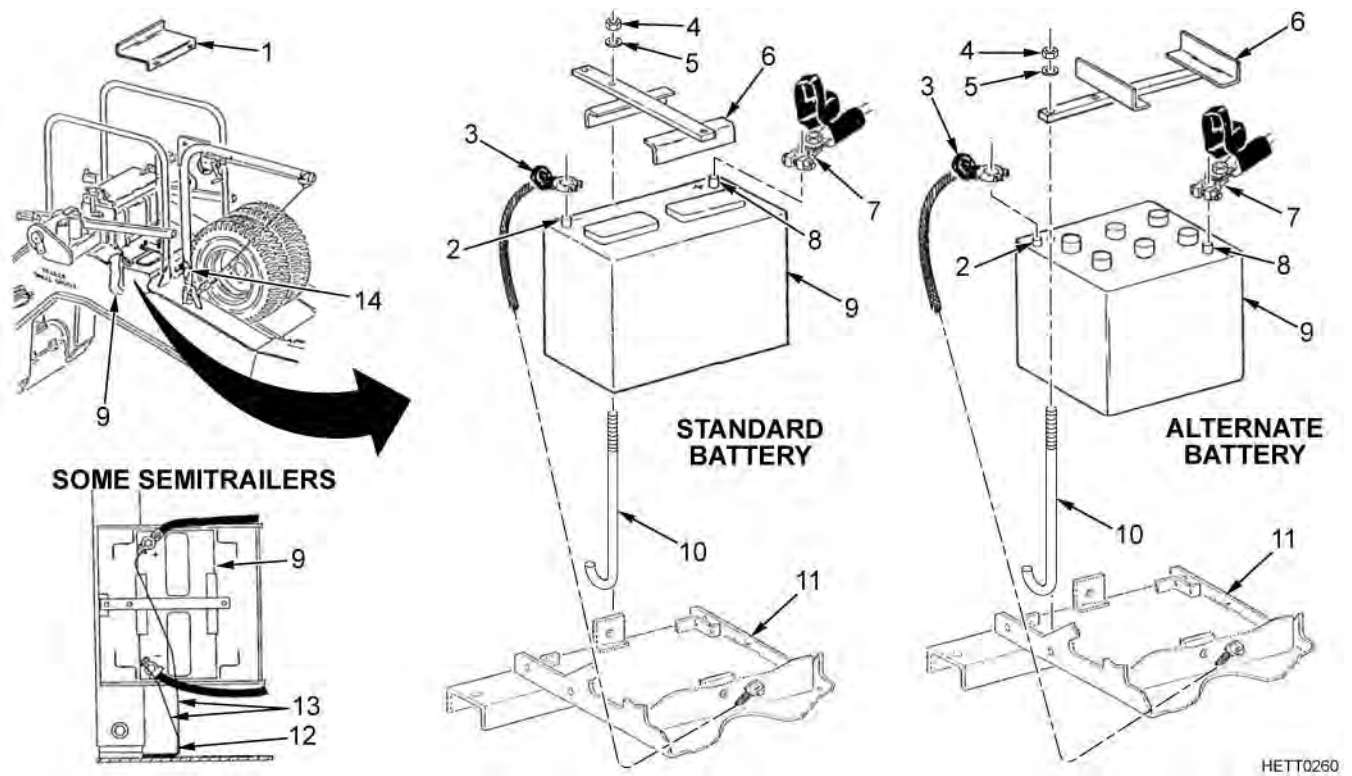


Figure 1. Battery Removal.

END OF TASK

INSPECTION

1. Use battery terminal cleaner, followed by sodium bicarbonate and water, to clean corrosion from both battery terminals and battery posts.
2. After cleaning, apply coat of petroleum jelly to both battery terminals and battery posts.
3. Perform all inspections and authorized repairs in accordance with TM 9-6140-200-14.
4. Remove battery cell caps from battery.
5. Inspect electrolyte level in each cell. If low, add distilled water using battery filler.
6. Use battery tester to take reading of electrolyte in each cell. If reading is low, charge battery. If level does not reach adequate reading, replace battery.
7. Attach battery charger to battery. Follow instructions on battery charger.
8. After charging battery, install battery cell caps onto battery.

END OF TASK**INSTALLATION**

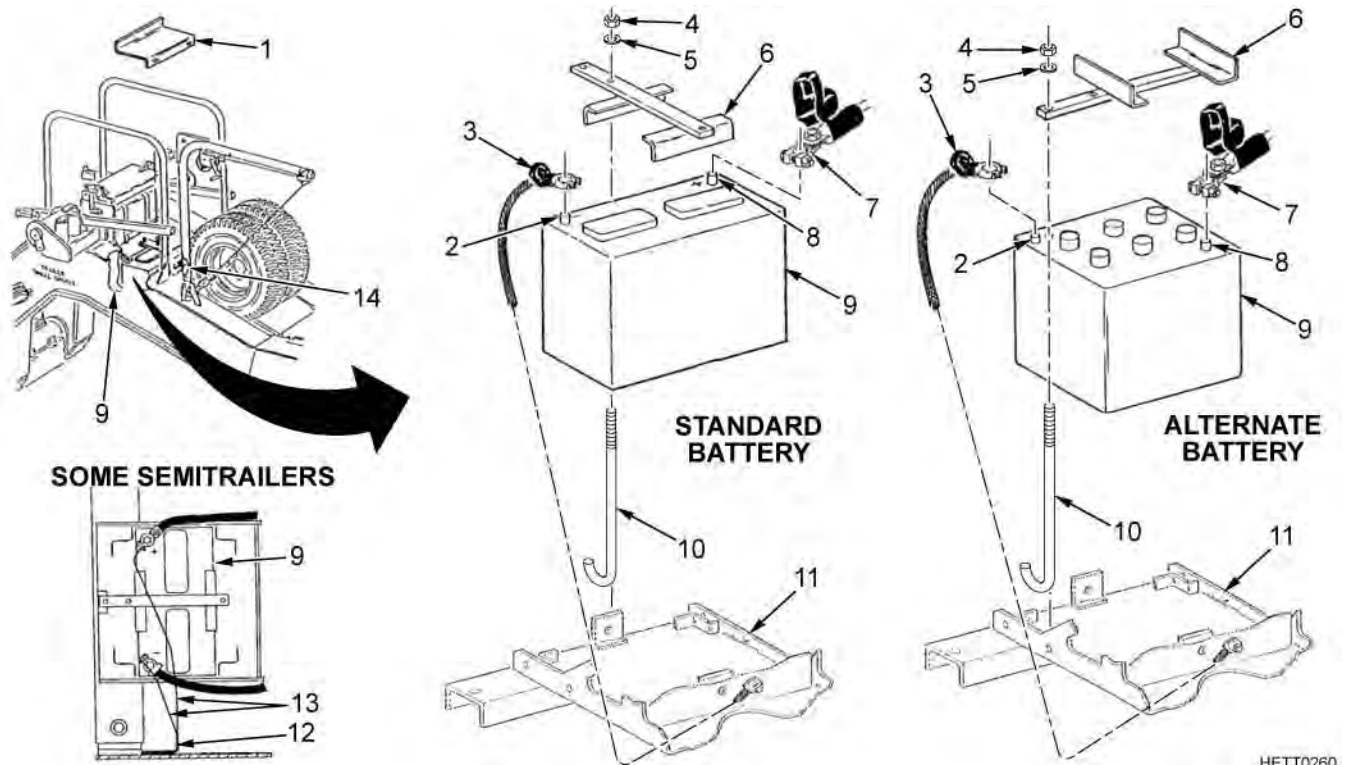
1. Install two bolts (Figure 2, Item 10), and use battery carrier, if necessary, to place battery (Figure 2, Item 9) on frame (Figure 2, Item 11).
2. Install hold-down bracket (Figure 2, Item 6) over battery (Figure 2, Item 9) and secure with two washers (Figure 2, Item 5) and new locknuts (Figure 2, Item 4).

CAUTION

Some semitrailers have solar battery charger leads connected to negative and positive battery terminals. Ensure these leads are not damaged when disconnecting terminals from battery posts.

3. Connect positive (+) terminal (Figure 2, Item 7) to positive (+) post (Figure 2, Item 8) on battery (Figure 2, Item 9), and connect negative (-) terminal (Figure 2, Item 3) to negative (-) post (Figure 2, Item 2) on battery. If equipped, DO NOT damage solar leads (Figure 2, Item 13) from W5 harness (Figure 2, Item 12) to battery terminals when disconnecting/connecting from battery posts.

4. Position stair (Figure 2, Item 1) on frame and hook two fasteners (Figure 2, Item 14).



END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**SOLAR BATTERY CHARGER INSTALLATION (SOME SEMITRAILERS)**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)

Equipment Conditions

Gooseneck adjusted fully down (WP 0007) or coupled to tractor (WP 0013)

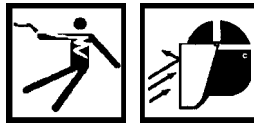
Materials/Parts

Lockwasher (4)

Personnel Required1

GENERAL INFORMATION

This work package contains instruction for the removal and installation of the solar battery charger (some semitrailers).

REMOVAL**WARNING**

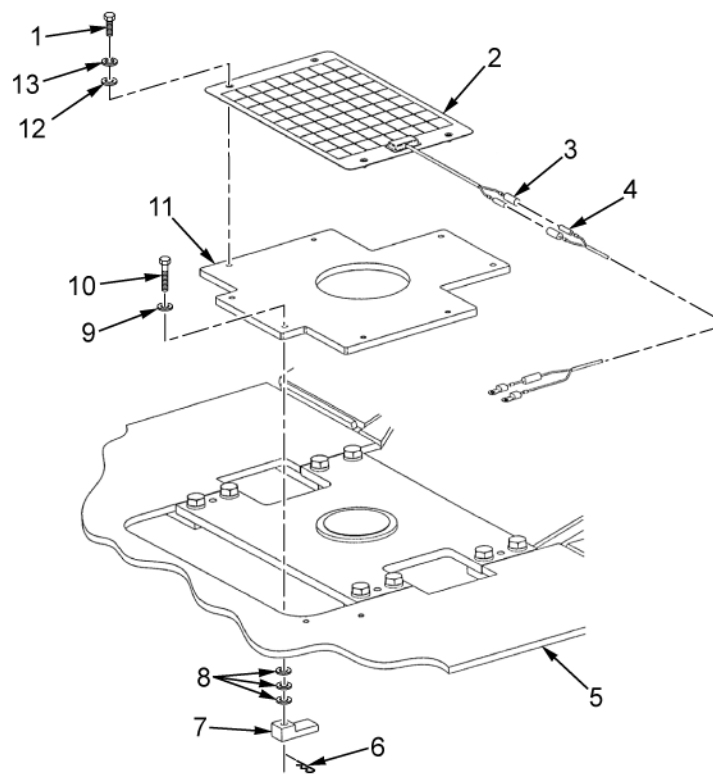
On some semitrailers a solar battery charger is mounted to top of gooseneck directly in front of spare tires. Persons working on top of gooseneck must take **EXTREME care not to step on it or trip over it. Failure to follow this warning may result in injury to personnel or damage to equipment.**

1. Disconnect solar panel leads (Figure 1, Item 3) from W5 harness (Figure 1, Item 4).
2. Loosen four bolts (Figure 1, Item 10) and turn four toe clamps (Figure 1, Item 7) 90 degrees from clamping position.
3. Lift mounting plate (Figure 1, Item 11), with solar panel (Figure 1, Item 2) attached, and remove from gooseneck (Figure 1, Item 5).

NOTE

Lockwashers may not be present. They are not used on initial assembly but are needed for reassembly.

4. Remove four capscrews (Figure 1, Item 1), washers (Figure 1, Item 12), lockwashers (Figure 1, Item 13), if present, and solar panel (Figure 1, Item 2) from mounting plate (Figure 1, Item 11). Discard lockwashers.
5. Remove four cotter pins (Figure 1, Item 6) from four bolts (Figure 1, Item 10) and unscrew four toe clamps (Figure 1, Item 7) from bolts. Remove three spring washers (Figure 1, Item 8) and washer (Figure 1, Item 9) from each bolt.



HETT0261

Figure 1. Solar Battery Charger Removal.

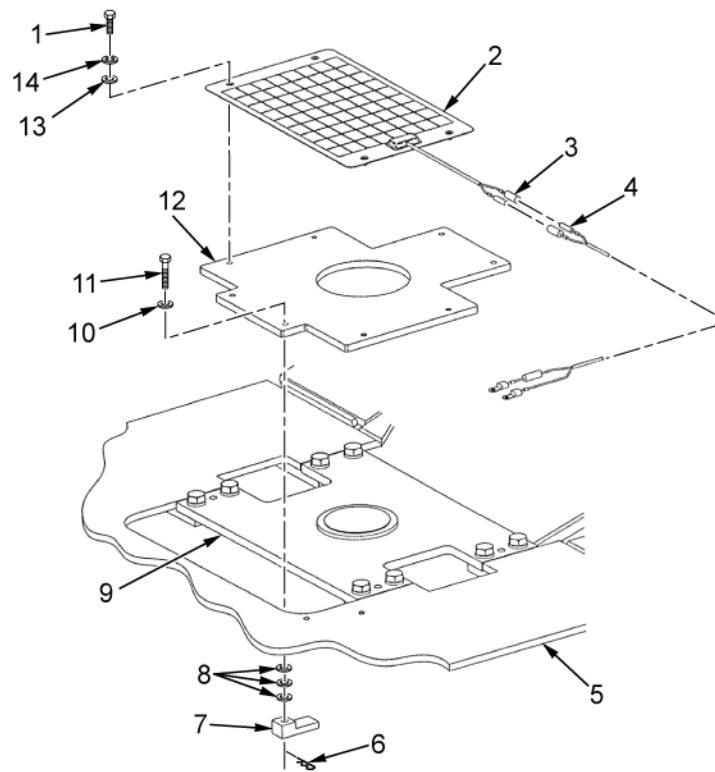
END OF TASK

INSTALLATION

WARNING

.....Qp'iqo g'igo ktckgt u'b'iqct 'dewgt { 'ej cti gt 'k/b qwpvgf 'v'vqr 'qhl qqgpgenif kt gev { 'lp'lt qp'v'qhl'ir ct g
kt guORgt uqpu'y qtnkpi 'qp'vqr 'qhl qqgpgenib wu'weng'GZVTGO G'ect g'p'q'v'q'lwgr 'qp'k'lt 'vt k'qxgt 'k0
Hckwt g'v'q'hmuy 'vj k'y ct plpi 'b c { 't gumw'lp'kplwt { 'v'f gt uqppgilt 'f co ci g'v'gs wlr o gpv0

1. Align solar panel (Figure 2, Item 2) to mounting plate (Figure 2, Item 12) so that bolt holes align with threaded inserts in mounting plate, and solar panel leads (Figure 2, Item 3) are to left side when viewed from long end of mounting plate. Secure solar panel to mounting plate with four capscrews (Figure 2, Item 1), lockwashers (Figure 2, Item 14), and washers (Figure 2, Item 13).
2. Install four washers (Figure 2, Item 10) onto four bolts (Figure 2, Item 11). Insert bolts into mounting plate (Figure 2, Item 12) with bolt heads on solar panel side. Install three spring washers (Figure 2, Item 8) to each bolt, positioned opposite each other for greatest extension. Screw four toe clamps (Figure 2, Item 7) onto four bolts and install four cotter pins (Figure 2, Item 6) into four bolts.
3. Lift mounting plate (Figure 2, Item 12), with solar panel (Figure 2, Item 2) attached, onto gooseneck (Figure 2, Item 5) and position onto steering retainer assembly (Figure 2, Item 9) with short end forward and solar panel leads (Figure 2, Item 3) to streetside of semitrailer.
4. Turn four toe clamps (Figure 2, Item 7) to clamping position (aligned fore and aft) and tighten four bolts (Figure 2, Item 11) until toe clamps firmly engage steering retainer assembly (Figure 2, Item 9).
5. Connect solar panel leads (Figure 2, Item 3) to W5 harness (Figure 2, Item 4).



HETT0933

Figure 2. Solar Battery Charger Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**WIRING HARNESS CLAMP AND GROMMET INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)

Nonmetallic Grommet (2)

Nonmetallic Grommet (1)

Materials/Parts

Locknut, Semitrailer With Incandescent Lights (6)

Locknut, Semitrailer With Led Lights (8)

Locknut (4)

Lockwasher, Semitrailer With Incandescent Lights (54)

Lockwasher, Semitrailer With Led Lights Nonmetallic
Grommet (50)

Nonmetallic Grommet (2)

Personnel Required

1

Equipment ConditionsGooseneck pneumatic lines removed from gladhands
(WP 0071)Clearance light access cover removed from deflector
(streetside or curbside, as applicable (WP 0097)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the wiring harness clamp and grommet.

REMOVAL**NOTE**

The following procedures identify typical clamp and grommet installations for each lettered area identified on the locator illustration. At various locations, the clamps may also secure pneumatic lines or hydraulic lines with the wiring harness bundle. Perform the following procedures, or any portion of the procedures, as required to complete the necessary repair.

1. Location A: Remove locknut (Figure 1, Item 3) and loop clamp (Figure 1, Item 2) from weld stud (Figure 1, Item 1). Discard locknut.
2. Location AA: Remove locknut (Figure 1, Item 12), loop clamp (Figure 1, Item 13), and screw (Figure 1, Item 15) from top of gooseneck (Figure 1, Item 14). Discard locknut.
3. Location B: Remove screw (Figure 1, Item 4), nut (Figure 1, Item 8), lockwasher (Figure 1, Item 7), and loop clamp (Figure 1, Item 6) from platform (Figure 1, Item 5). Discard lockwasher.
4. Location C: Remove nut (Figure 1, Item 11), lockwasher (Figure 1, Item 10), and loop clamp (Figure 1, Item 9) from weld stud (Figure 1, Item 1). Discard lockwasher.
5. Location D: Remove nut (Figure 1, Item 19), lockwasher (Figure 1, Item 20), and loop clamp (Figure 1, Item 21) from weld stud (Figure 1, Item 1). Discard lockwasher.
6. Location E: Remove nut (Figure 1, Item 16), lockwasher (Figure 1, Item 17), and loop clamp (Figure 1, Item 18) from weld stud (Figure 1, Item 1). Discard lockwasher.

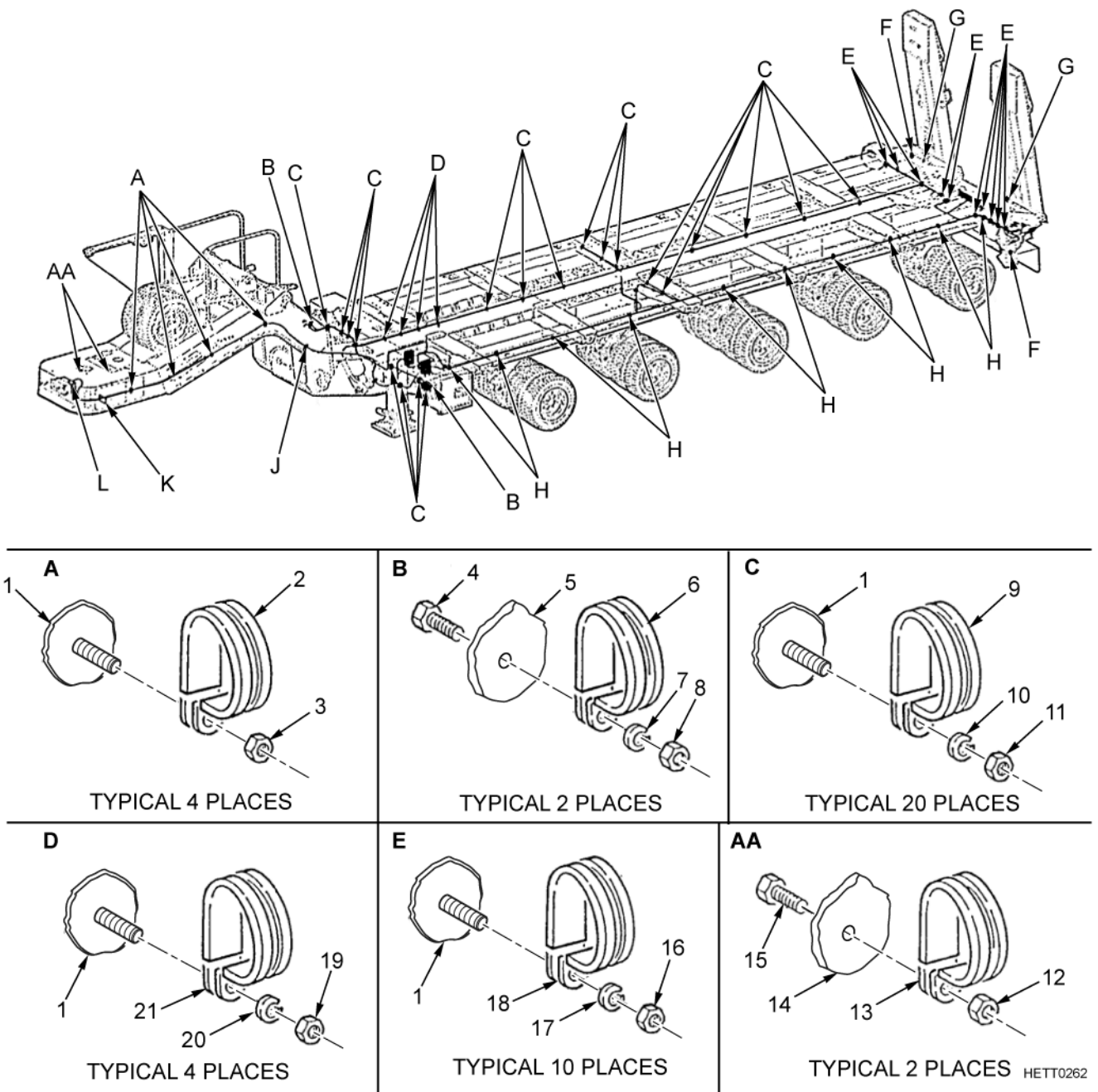


Figure 1. Wiring Harness Clamp and Grommet Removal.

NOTE

On some semitrailers, three loop clamps are replaced by three connector clips.

7. Location F: Remove three loop clamps (Figure 2, Item 4), loop clamp (Figure 2, Item 3), and grommet (Figure 2, Item 6) as follows:
 - a. Disconnect W2 harness leads from clearance and marker lights.
 - b. Remove nut (Figure 2, Item 1), lockwasher (Figure 2, Item 2), and loop clamp (Figure 2, Item 4) from weld stud (Figure 2, Item 11). Discard lockwasher. Some semitrailers: remove four locknuts (Figure 2, Item 9) and two connector clips (Figure 2, Item 8) from weld studs. Discard locknuts.
 - c. Remove screw (Figure 2, Item 10), nut (Figure 2, Item 1), lockwasher (Figure 2, Item 2), and loop clamp (Figure 2, Item 4) from deflector (Figure 2, Item 5). Discard lockwasher.
 - d. Remove screw (Figure 2, Item 7), nut (Figure 2, Item 1), lockwasher (Figure 2, Item 2), loop clamp (Figure 2, Item 3), nut, lockwasher, and loop clamp (Figure 2, Item 4) from deflector (Figure 2, Item 5). Discard lockwashers. Some semitrailers: remove two screws, locknuts (Figure 2, Item 9), and connector clip (Figure 2, Item 8) from deflector. Discard lockwashers.
 - e. Pull W2 harness leads through loop clamp (Figure 2, Item 3) and remove grommet (Figure 2, Item 6) and deflector (Figure 2, Item 5). Discard grommet.
8. Location G: Remove locknut (Figure 2, Item 25), screw (Figure 2, Item 22), and loop clamp (Figure 2, Item 24) from beavertail (Figure 2, Item 23). Discard locknut.
9. Location H: Remove nut (Figure 2, Item 27), lockwasher (Figure 2, Item 28), and loop clamp (Figure 2, Item 26) from weld stud (Figure 2, Item 11). Discard lockwasher.
10. Location J: Remove locknut (Figure 2, Item 13) and loop clamp (Figure 2, Item 12) from weld stud (Figure 2, Item 11). Discard locknut.

CAUTION

During mounting plate removal, the air lines and W1 harness must be allowed to slide in the grommets or damage to equipment may result.

11. Location K: Remove mounting plate and grommets as follows:
 - a. Remove four locknuts (Figure 2, Item 21) and mounting plate (Figure 2, Item 18) from weld studs (Figure 2, Item 17). Discard locknuts.
 - b. Loosen and slide two grommets (Figure 2, Item 19) and grommet (Figure 2, Item 20) forward along two air lines and W1 harness.
 - c. Pull two grommets (Figure 2, Item 19 and Item 20) from two air lines and W1 harness. Discard grommets.
12. Location L: Remove locknut (Figure 2, Item 14) and loop clamp (Figure 2, Item 15) from gooseneck component assembly (Figure 2, Item 16).
13. Inspect loop clamps and connector clips (some semitrailers) for excessive wear, cracks, or other apparent damage. If any defects are found, replace parts as necessary.
14. Inspect all harnesses for chafing, cuts, breaks, or signs of excessive wear. If defects are found, refer to applicable paragraph and replace harness as required.

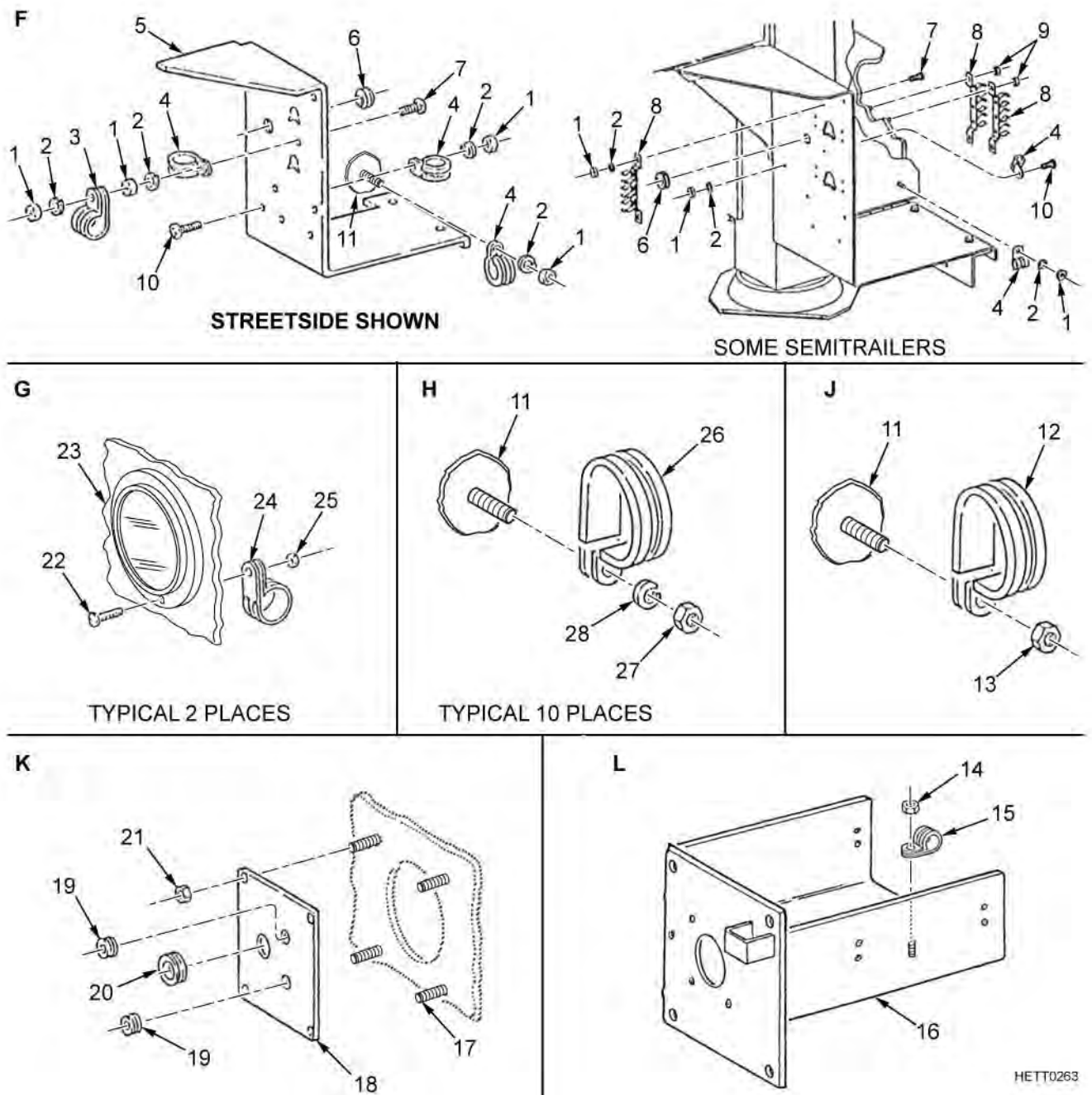


Figure 2. Wiring Harness Clamp and Grommet Removal.

END OF TASK

INSTALLATION

1. Location L: Install loop clamp (Figure 3, Item 15) to gooseneck component assembly (Figure 3, Item 16) and secure with locknut (Figure 3, Item 14).
2. Location K: Install mounting plate and grommets as follows:
 - a. Slide two grommets (Figure 3, Item 19 and Item 20) over two air lines and W1 harness.
 - b. Slide grommets (Figure 3, Item 19) up to mounting plate (Figure 3, Item 18). Install grommets in mounting plate, ensuring each grommet is secure to mounting plate.
 - c. Install mounting plate (Figure 3, Item 18) onto weld studs (Figure 3, Item 17) and secure with four locknuts (Figure 3, Item 21).
3. Location J: Install loop clamp (Figure 3, Item 12) to weld stud (Figure 3, Item 11) and secure with locknut (Figure 3, Item 13).
4. Location H: Install loop clamp (Figure 3, Item 26) to weld stud (Figure 3, Item 11) and secure with lockwasher (Figure 3, Item 28) and nut (Figure 3, Item 27).
5. Location G: Install loop clamp (Figure 3, Item 24) onto beavertail (Figure 3, Item 23) and secure with screw (Figure 3, Item 22) and locknut (Figure 3, Item 25).
6. Location F: Install three loop clamps (Figure 3, Item 4), loop clamp (Figure 3, Item 3), and grommet (Figure 3, Item 6) as follows:
 - a. Install grommet (Figure 3, Item 6) in deflector (Figure 3, Item 5) and pull W2 harness leads through grommet.
 - b. Position loop clamp (Figure 3, Item 4) at proper mounting hole on deflector (Figure 3, Item 5) and secure with screw (Figure 3, Item 7), lockwasher (Figure 3, Item 2), nut (Figure 3, Item 1), loop clamp (Figure 3, Item 3), lockwasher, and nut. Some semitrailers: position connector clip (Figure 3, Item 8) at proper mounting holes on deflector and secure with two screws and locknuts (Figure 3, Item 9).
 - c. Position loop clamp (Figure 3, Item 4) at proper mounting hole on deflector (Figure 3, Item 5) and secure with screw (Figure 3, Item 10), lockwasher (Figure 3, Item 2), and nut (Figure 3, Item 1).
 - d. Install loop clamp (Figure 3, Item 4) on weld stud (Figure 3, Item 11) and secure with lockwasher (Figure 3, Item 2) and nut (Figure 3, Item 1). Some semitrailers: install two connector clips (Figure 3, Item 8) to four weld studs and secure with four locknuts (Figure 3, Item 9).
 - e. Reconnect W2 harness leads to clearance and marker lights.
 - f. Install clearance light access cover to deflector (Figure 3, Item 5) per (WP 0099).

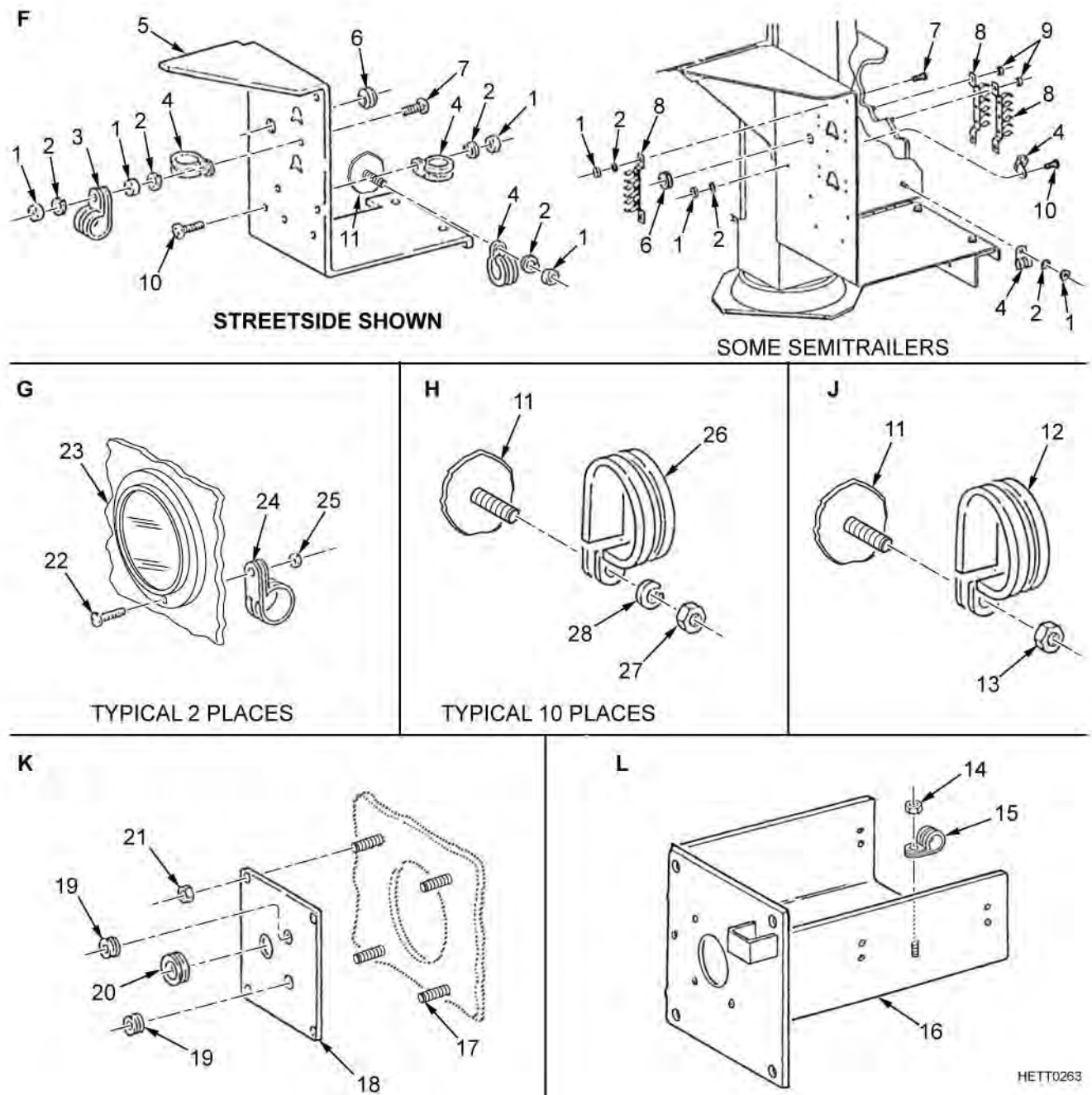


Figure 3. Wiring Harness Clamp and Grommet Installation.

7. Location E: Install loop clamp (Figure 4, Item 18) on weld stud (Figure 4, Item 1) and secure with lockwasher (Figure 4, Item 17) and nut (Figure 4, Item 16).
8. Location D: Install loop clamp (Figure 4, Item 21) on weld stud (Figure 4, Item 1) and secure with lockwasher (Figure 4, Item 20) and nut (Figure 4, Item 19).
9. Location C: Install loop clamp (Figure 4, Item 9) on weld stud (Figure 4, Item 1) and secure with lockwasher (Figure 4, Item 10) and nut (Figure 4, Item 11).
10. Location B: Position loop clamp (Figure 4, Item 6) on platform (Figure 4, Item 5) and secure with screw (Figure 4, Item 4), lockwasher (Figure 4, Item 7), and nut (Figure 4, Item 8).
11. Location A: Install loop clamp (Figure 4, Item 2) on weld stud (Figure 4, Item 1) and secure with locknut (Figure 4, Item 3).
12. Location AA: Install loop clamp (Figure 4, Item 13) on top of gooseneck (Figure 4, Item 14) and secure with screw (Figure 4, Item 15) and locknut (Figure 4, Item 12).

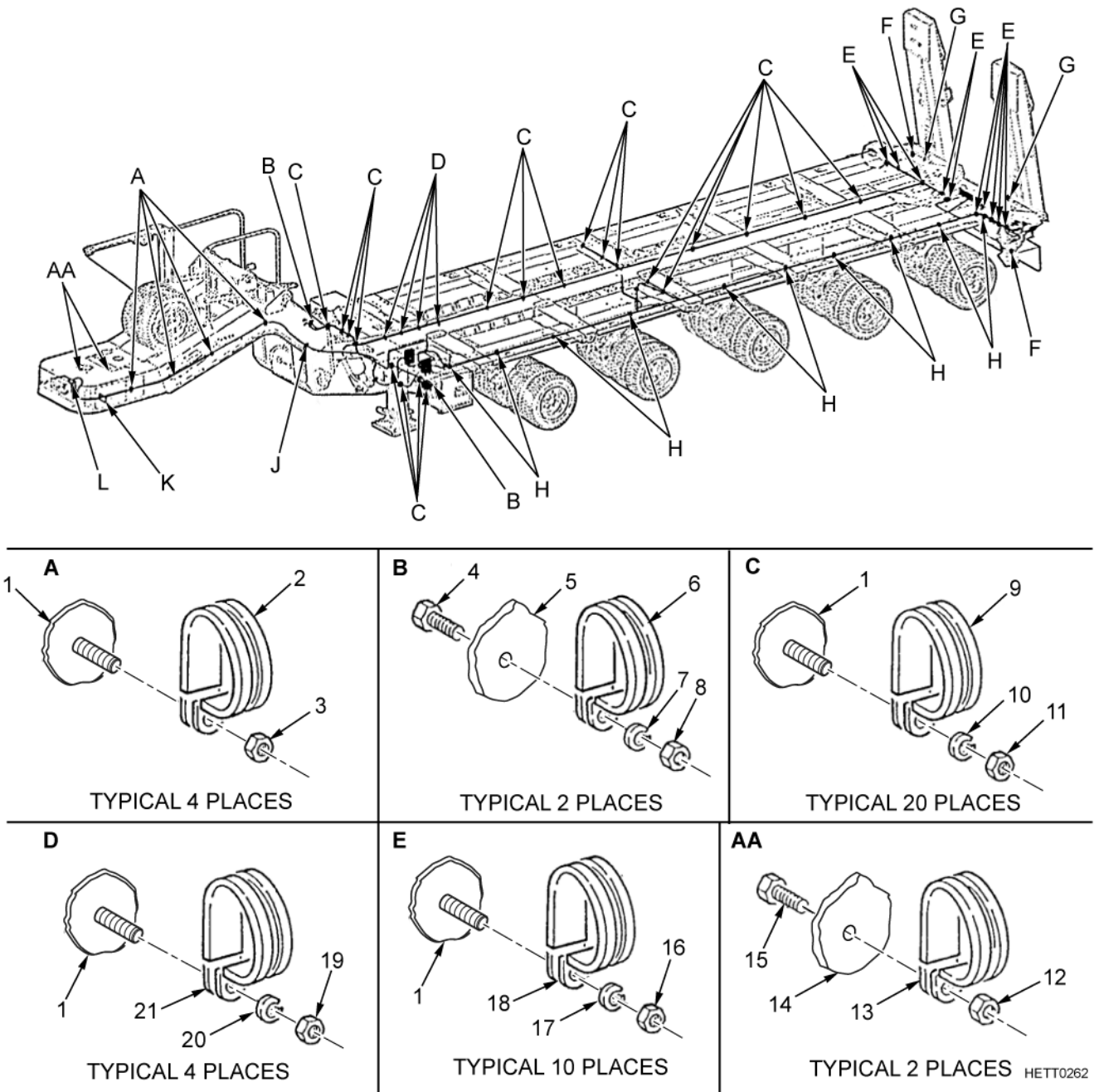


Figure 4. Wiring Harness Clamp and Grommet Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**APU CONTROL BOX JUMPER WIRES AND TIMER HARNESS**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Personnel Required

1

Equipment Conditions

Negative lead from battery disconnected (WP 0051)

Materials/Parts

Sleeving, Electrical Insulation (WP 0170, Item 26)
Lockwasher (4)

GENERAL INFORMATION

This work package contains instructions for the removal, repair, and installation of the Auxiliary Power Unit (APU) control box jumper wires and timer harness.

REMOVAL**NOTE**

On Auxiliary Power Unit (APU) with APU engine serial number 504697 and subsequent numbers, the glow plug indicator is changed from a glow-type indicator to a lamp driven by a timer.

1. Open cover to APU control box (Figure 1, Item 21) by lifting up retainer (Figure 1, Item 1) and lowering cover weldment (Figure 1, Item 19).
2. Remove four screws (Figure 1, Item 16), lockwashers (Figure 1, Item 17), and access plate (Figure 1, Item 18) from APU control box. Discard lockwashers.
3. Use APU electrical schematic rear foldout Figure FO-4 as a guide to tag and disconnect jumper wire (Figure 1, Item 11) from starter switch (Figure 1, Item 10) terminal B.
4. Cut existing heat shrink tubing (Figure 1, Item 8) and disconnect diode (Figure 1, Item 9) from jumper wire (Figure 1, Item 11) and APU wiring harness (Figure 1, Item 7).
5. On glow-type glow plug indicator only, tag and disconnect jumper wire (Figure 1, Item 15) from starter switch (Figure 1, Item 10) terminal GL and glow plug indicator (Figure 1, Item 14).
6. On lamp-type glow plug indicator, unplug timer harness connector (Figure 1, Item 12) from timer (Figure 1, Item 2). Unplug timer harness wires (Figure 1, Item 12) from glow plug indicator (Figure 1, Item 13).
7. Use APU electrical schematic rear foldout Figure FO-4 as a guide to tag and disconnect timer harness wires (Figure 1, Item 12) from starter switch (Figure 1, Item 10) terminals GL and ST.
8. Remove capscrew (Figure 1, Item 20), nut (Figure 1, Item 6), lockwasher (Figure 1, Item 5), washer (Figure 1, Item 4), and timer harness (Figure 1, Item 3) from timer (Figure 1, Item 2) and APU control box (Figure 1, Item 21).

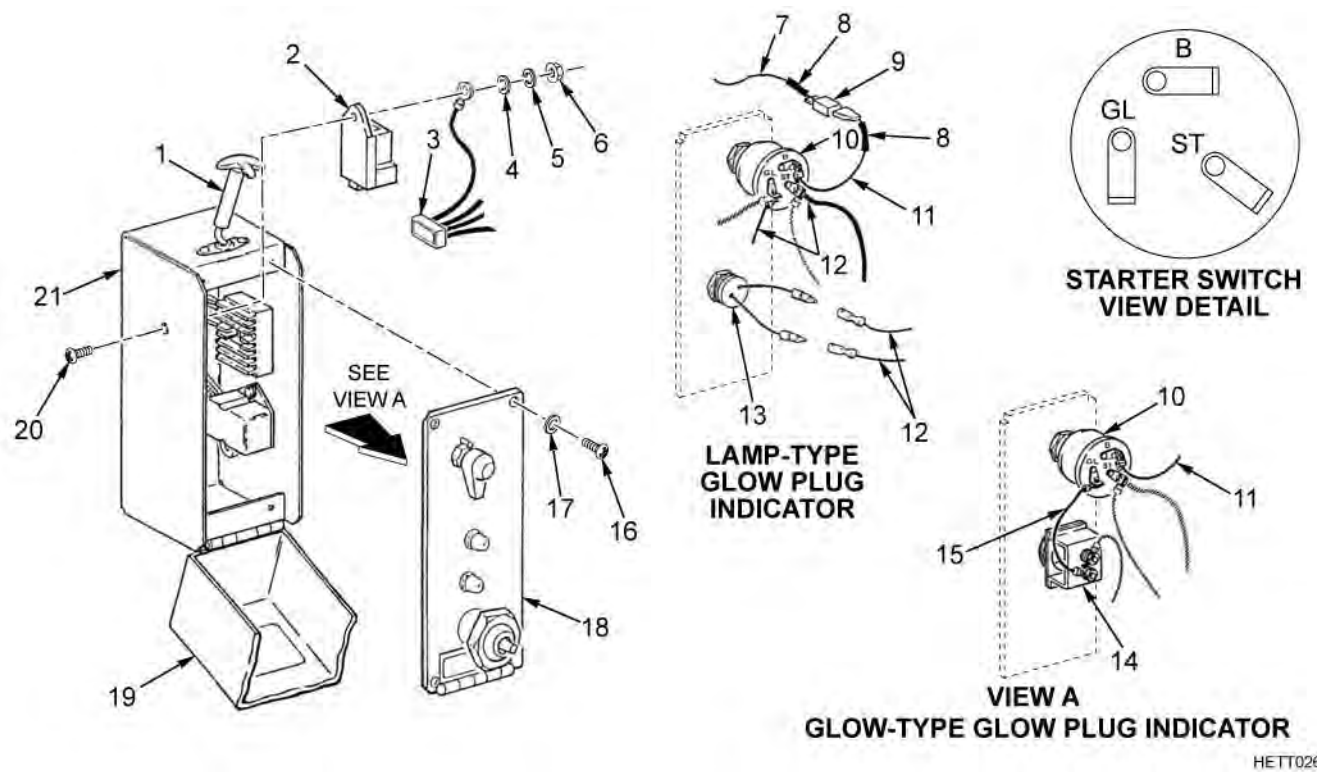


Figure 1. APU Control Box Jumper Wires and Timer Harness Removal.

END OF TASK

REPAIR

1. Inspect APU control box jumper wires for missing or unreadable wire markers. If defective, apply new markings or replace wire markers. Use APU electrical schematic rear foldout Figure FO-4 as a guide for proper wire markings.
2. Inspect APU control box jumper wires and timer harness for frayed or broken wires and loose terminal lugs. If defects exist, use electrical repair kit and replace defective terminal lugs, jumper wire assembly, or timer harness.
3. Use an ohmmeter to check resistance of diode in both directions. If diode fails resistance check, replace diode.
4. Refer to WP 0146. Use electrical repair kit and measuring tape to fabricate new APU control box jumper wires as required.
5. Use wire stripper to strip wires to designated length to allow for terminals to be installed.
6. Use electrical repair kit to crimp terminal lugs onto fabricated jumper wires as required.

END OF TASK**INSTALLATION****NOTE**

On APU with APU engine serial number 504697 and subsequent numbers, the glow plug indicator is changed from a glow-type indicator to a lamp driven by a timer.

1. On lamp-type glow plug indicator, install ground wire on timer harness (Figure 2, Item 3) and secure to APU control box (Figure 2, Item 21) using screw (Figure 2, Item 20), timer (Figure 2, Item 2), washer (Figure 2, Item 4), lockwasher (Figure 2, Item 5), and nut (Figure 2, Item 6).
2. Plug timer harness connectors (Figure 2, Item 12) into timer (Figure 2, Item 2).
3. Use APU electrical schematic rear foldout Figure FO-4 as a guide to connect tagged timer harness wires (Figure 2, Item 3) to starter switch (Figure 2, Item 10) terminals GL and ST.
4. Plug timer harness wires (Figure 2, Item 3) to glow plug indicator (Figure 2, Item 13) wires.
5. Slide a 3 in. (7.6 cm) piece of heat shrink tubing (Figure 2, Item 8) over quick-disconnect plug on APU wiring harness (Figure 2, Item 7).
6. Use APU electrical schematic rear foldout Figure FO-4 as a guide to reconnect diode (Figure 2, Item 9) to jumper wire (Figure 2, Item 11). Reconnect jumper wire to starter switch (Figure 2, Item 10) terminal B.
7. Reconnect open end of diode (Figure 2, Item 9) to existing APU harness wire (Figure 2, Item 7).
8. Slide heat shrink tubing (Figure 2, Item 8) over both quick-disconnect plugs and diode (Figure 2, Item 9). Using soldering torch kit, shrink heat shrink tubing over quick-disconnect plugs and diode.
9. On glow-plug type indicator, refer to APU electrical schematic rear foldout Figure FO-1 and reconnect jumper wire (Figure 2, Item 15) to glow plug indicator (Figure 2, Item 14) and starter switch (Figure 2, Item 10) terminal GL.
10. Align and install access plate (Figure 2, Item 18) to APU control box and secure with four screws (Figure 2, Item 16) and lockwashers (Figure 2, Item 17).
11. Raise cover weldment (Figure 2, Item 19) and secure to APU control box (Figure 2, Item 21) by rehooking retainer (Figure 2, Item 1).

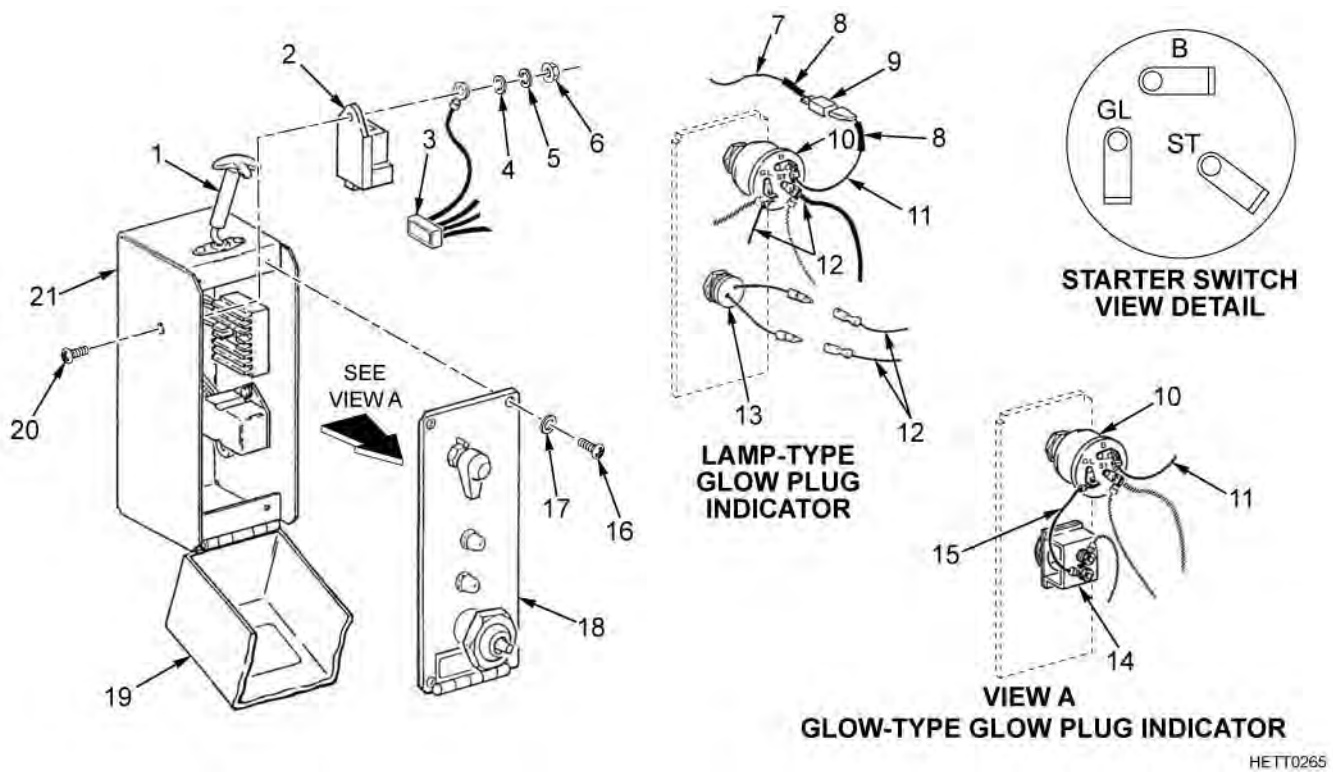


Figure 2. APU Control Box Jumper Wires and Timer Harness Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Perform APU starting and check glow plug indicator for proper operation (WP 0005).

END OF WORK PACKAGE

FIELD MAINTENANCE**HYDRAULIC CONTROL MODULE JUMPER WIRES**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Personnel Required

2

Materials/Parts

Sleeving, Electrical Insulation (WP 0170, Item 26)
Solder (WP 0170, Item 30)
Lockwasher (4)
Lockwasher (1)

Equipment Conditions

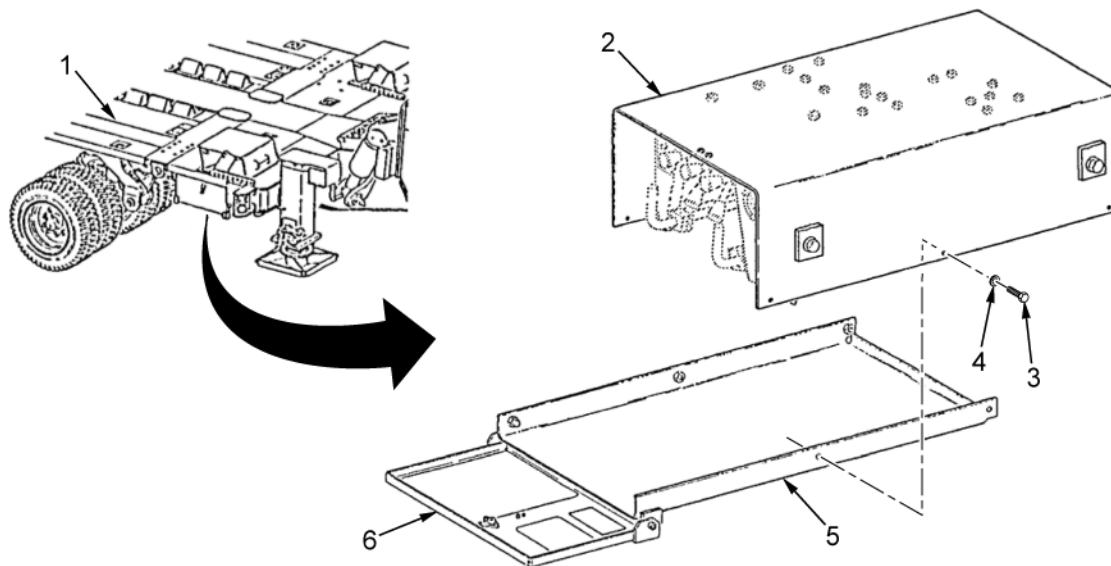
Intervehicular cables disconnected, wheels chocked
(WP 0013)
Front and rear support legs lowered supporting platform
(WP 0011 and WP 0012)

GENERAL INFORMATION

This work package contains instructions for the removal, repair, and installation of the hydraulic control module jumper wires.

REMOVAL

1. Ensure hydraulic control module door panel is lowered (WP 0004).
2. Use two people to remove six capscrews (Figure 1, Item 3), lockwashers (Figure 1, Item 4), and lower panel (Figure 1, Item 5) from hydraulic control module (Figure 1, Item 2). Carefully remove lower panel, with panel door (Figure 1, Item 6) attached, out from under semitrailer and place on platform (Figure 1, Item 1). Discard lockwashers.



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Figure 1. Hydraulic Control Module Removal.

3. Refer to electrical schematic rear foldout Figure FO-1 and tag and disconnect jumper wires (Figure 2, Item 8 and Item 10) from four pressure switches (Figure 2, Item 11).
4. Remove screw (Figure 2, Item 1), lockwasher (Figure 2, Item 9), and wire (Figure 2, Item 8) from steering control manifold (Figure 2, Item 7). Discard lockwasher.
5. Remove nut (Figure 2, Item 2) and tag and disconnect wire (Figure 2, Item 3) from pressure switch (Figure 2, Item 11).

WARNING

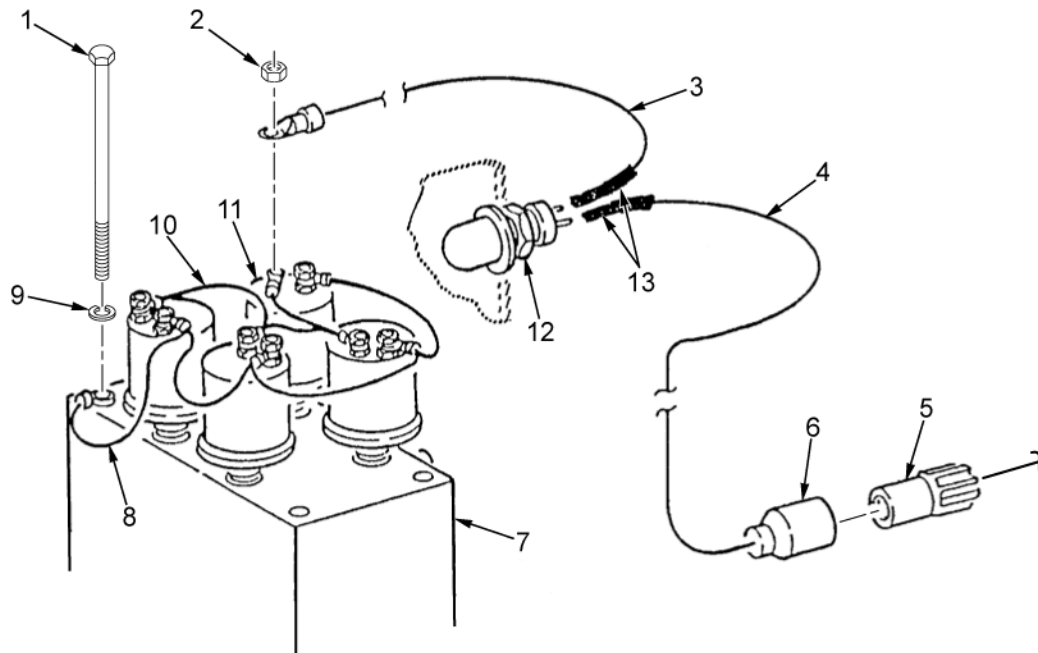


Soldering fumes are toxic. Avoid breathing these fumes. Work in a well-ventilated area or injury to personnel may result.

CAUTION

Rosin core solder contains flux, which is corrosive. All soldered connections must be cleaned of all flux residue or damage to equipment may result.

6. Use soldering gun to remove heat shrink tubing (Figure 2, Item 13) and unsolder wires (Figure 2, Item 3 and Item 4) from steering pressure indicator light (Figure 2, Item 12).
7. Refer to electrical schematic rear foldout Figure FO-1 and tag and disconnect socket connector (Figure 2, Item 6) from W3 harness (Figure 2, Item 5).



HETT0267

Figure 2. Pressure Switches Removal.

END OF TASK

REPAIR

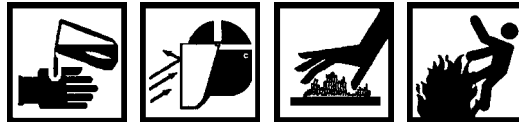
1. Inspect hydraulic control module jumper wires for missing or unreadable wire markers. If defective, apply new markings or replace wire markers. Use electrical schematic rear foldout Figure FO-1 for proper wire markings.
2. Inspect hydraulic control module jumper wires for frayed or broken wires and loose terminal lugs. If defects exist, use electrical repair kit and replace defective terminal lugs or entire jumper wire assembly.
3. Refer to WP 0146. Use electrical repair kit and measuring tape to fabricate new hydraulic control module jumper wires as required.
4. Use wire stripper to strip wires to designated length to allow for terminals to be installed.
5. Use electrical repair kit to crimp terminal lugs onto fabricated jumper wires as required.

END OF TASK

INSTALLATION

1. Align ground lead of jumper wire (Figure 3, Item 8) with steering control manifold (Figure 3, Item 7) and secure in place by loosely installing lockwasher (Figure 3, Item 9) and screw (Figure 3, Item 1).
2. Refer to electrical schematic rear foldout Figure FO-1 and reconnect wire (Figure 3, Item 3) to pressure switch (Figure 3, Item 11) and secure with nut (Figure 3, Item 2).

WARNING

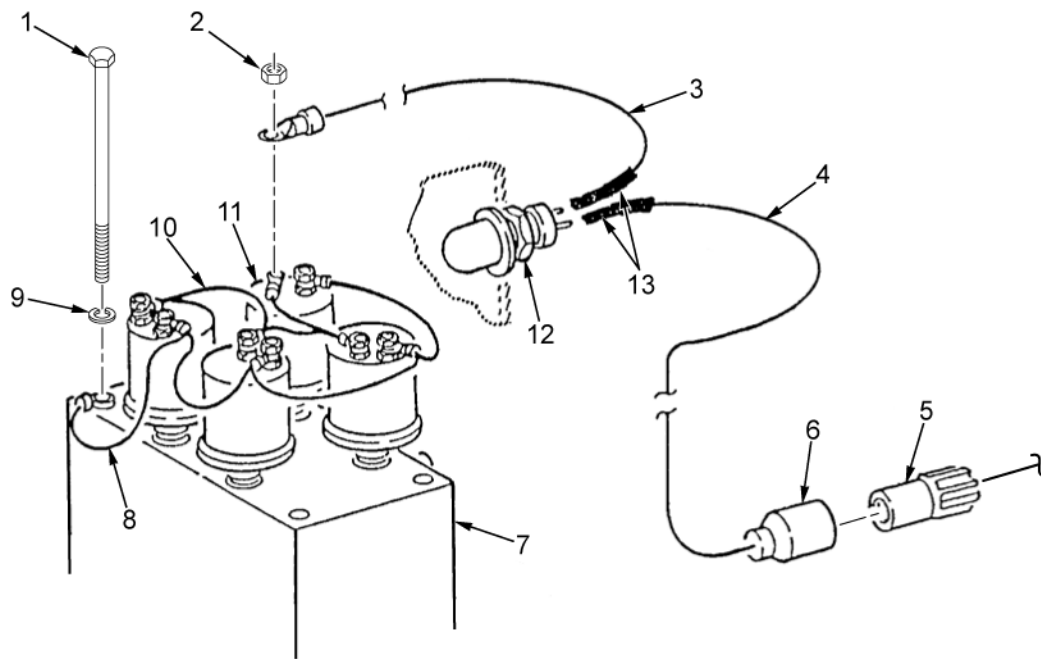


Soldering fumes are toxic. Avoid breathing these fumes. Work in a well-ventilated area or injury to personnel may result.

CAUTION

Rosin core solder contains flux, which is corrosive. All soldered connections must be cleaned of all flux residue or damage to equipment may result.

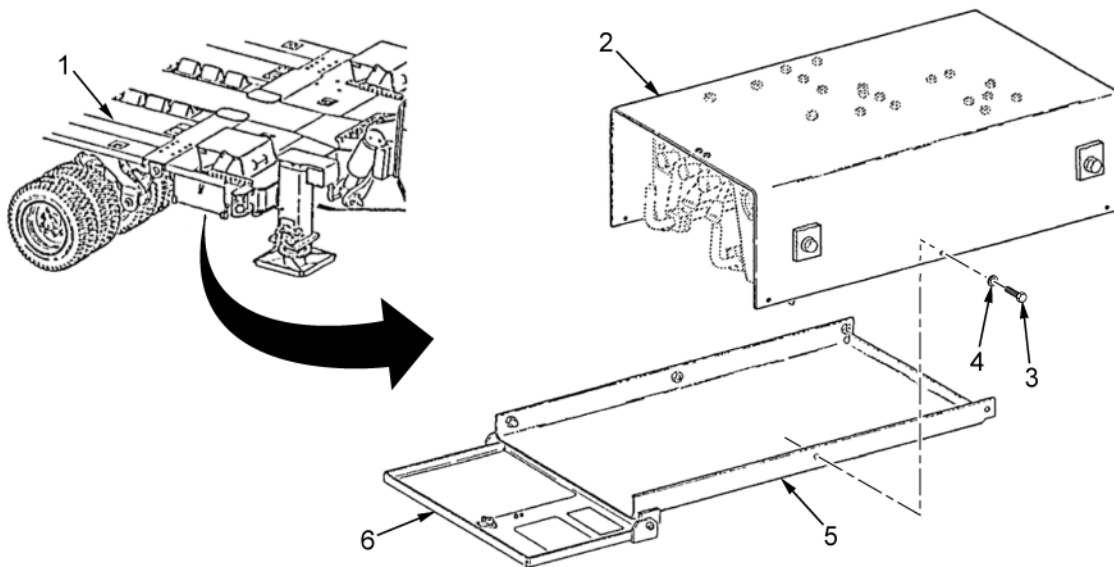
3. Install heat shrink insulation over wires (Figure 3, Item 3 and Item 4). Refer to electrical schematic rear foldout Figure FO-1, and use soldering gun to solder wires (Figure 3, Item 3 and Item 4) to steering pressure indicator light (Figure 3, Item 12). Use soldering torch kit to shrink heat shrink tubing (Figure 3, Item 13) onto soldered joints.
4. Refer to electrical schematic rear foldout Figure FO-1 and connect socket connector (Figure 3, Item 6) to W3 harness (Figure 3, Item 5).
5. Refer to electrical schematic rear foldout Figure FO-1 and reconnect both jumper wires (Figure 3, Item 8 and Item 10) to four pressure switches (Figure 3, Item 11). Tighten screw (Figure 3, Item 1).



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Figure 3. Pressure Switches Installation.

6. Use two people to carefully position lower panel (Figure 4, Item 5), with panel door (Figure 4, Item 6) attached, over hydraulic control module (Figure 4, Item 2) on underside of semitrailer (Figure 4, Item 1). Secure with six lockwashers (Figure 4, Item 4) and capscrews (Figure 4, Item 3).



HETT0479

Figure 4. Hydraulic Control Module Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start Auxiliary Power Unit (APU) (WP 0005).

Connect intervehicular cables, turn on semitrailer running lights, and check steering pressure indicator light for proper operation (WP 0013).

END OF WORK PACKAGE

FIELD MAINTENANCE

JUNCTION BOX JUMPER WIRES

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Materials/Parts

Solvent, Dry Cleaning (WP 0170, Item 32)

Personnel Required

1

Equipment Conditions

Front and rear support legs lowered supporting platform (WP 0011 and WP 0012)
Intervehicular cables disconnected and wheels chocked (WP 0013)

GENERAL INFORMATION

This work package contains instructions for removal, repair, and installation for junction box jumper wires.

REMOVAL

1. Unscrew two captive screws (Figure 1, Item 2) and access cover (Figure 1, Item 1) from junction box TB1 (Figure 1, Item 7).
2. Refer to electrical schematic rear foldout Figure FO-1 and tag and disconnect jumper wire (Figure 1, Item 8) from junction box TB1 (Figure 1, Item 7) terminals TB1-YEL and TB1-BLK.
3. Unscrew two captive screws (Figure 1, Item 5) and remove access cover (Figure 1, Item 4) from junction box TB2 (Figure 1, Item 3).
4. Refer to electrical schematic rear foldout Figure FO-1 and tag and disconnect jumper wire (Figure 1, Item 6) from junction box TB2 (Figure 1, Item 3) terminals TB2-BLU and TB2-BLK.

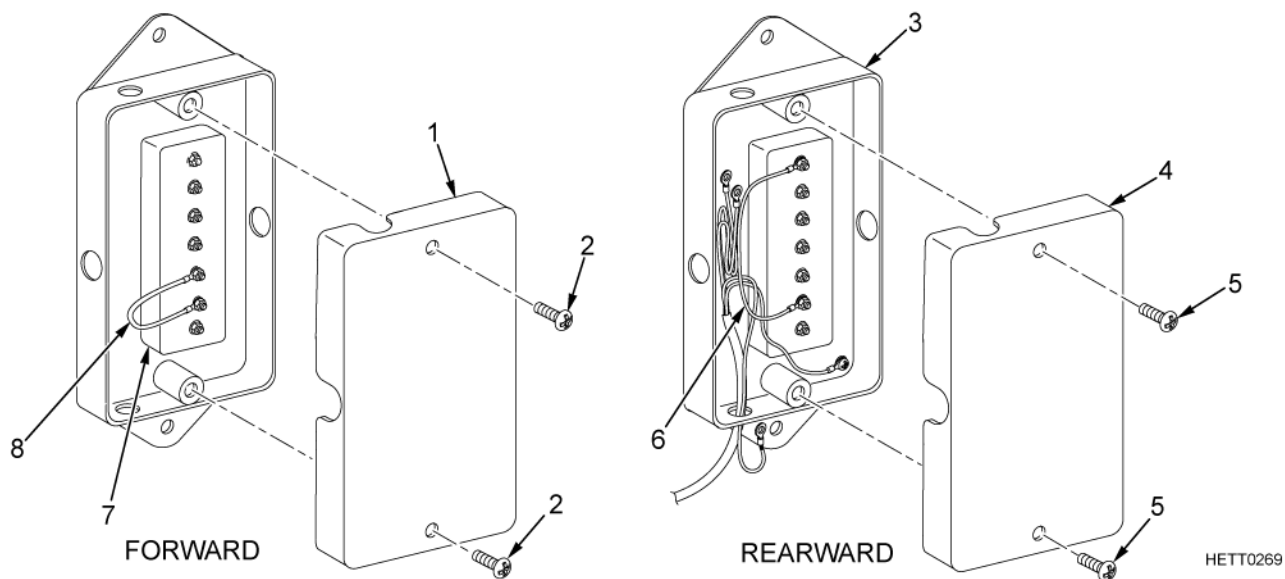


Figure 1. Junction Box TB1 and TB2 Removal.

END OF TASK

REPAIR

1. Inspect junction box jumper wires for missing or unreadable wire markers. If defective, apply new markings or replace wire markers. Use semitrailer electrical schematic rear foldout Figure FO-1 as a guide for proper wire markings.
2. Inspect junction box jumper wires for frayed or broken wires and loose terminal lugs. If defects exist, use electrical repair kit and replace defective terminal lugs or entire jumper wire assembly.

WARNING**SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
- The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound.
- Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.

Failure to follow these warnings may result in serious injury or death to personnel.

3. Inspect terminal boards TB1 (Figure 2, Item 1) and TB2 (Figure 2, Item 2) for missing screws, breaks, cracks, and excessive corrosion. If corroded, clean using dry cleaning solvent as required. If defective, replace as required.
4. Refer to WP 0164. Use electrical repair kit and measuring tape to fabricate new junction box jumper wires as required.
5. Use wire stripper to strip wires to designated length to allow for terminals to be installed.
6. Use electrical repair kit to crimp terminal lugs onto fabricated jumper wires as required.

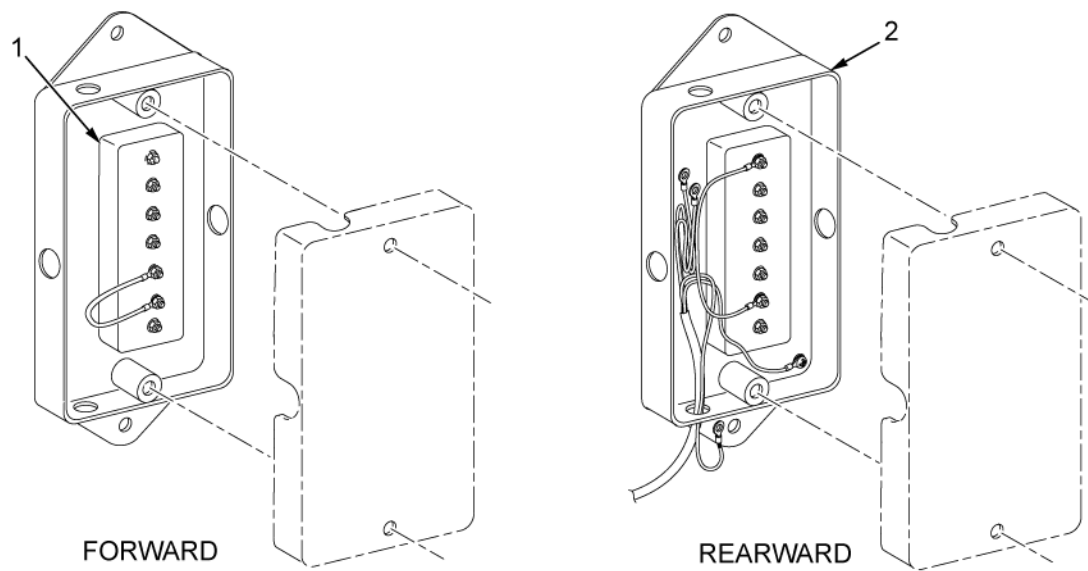


Figure 2. Junction Box TB1 and TB2 Repair.

END OF TASK

INSTALLATION

1. Refer to electrical schematic rear foldout Figure FO-1 and reconnect jumper wire (Figure 3, Item 6) to junction box TB2 (Figure 3, Item 3) terminals TB2-BLU and TB2-BLK.
2. Install access cover (Figure 3, Item 4) to junction box TB2 (Figure 3, Item 3) and secure with two captive screws (Figure 3, Item 5).
3. Refer to electrical schematic rear foldout Figure FO-1 and reconnect jumper wire (Figure 3, Item 8) to junction box TB1 (Figure 3, Item 7) terminals TB1-YEL and TB1-BLK.
4. Install access cover (Figure 3, Item 1) to junction box TB1 (Figure 3, Item 7) and secure with two captive screws (Figure 3, Item 2).

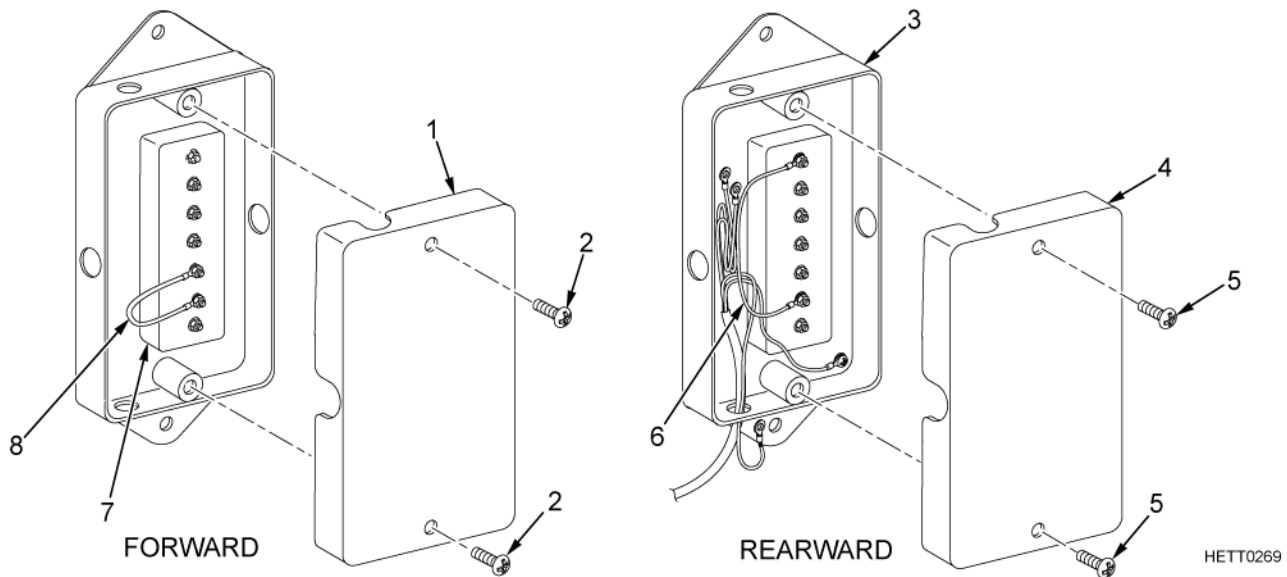


Figure 3. Junction Box TB1 and TB2 Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Start Auxiliary Power Unit (APU) (WP 0020).

Connect intervehicular cables, turn on semitrailer running lights, and check semitrailer running lights and blackout lights for proper operation (WP 0013).

END OF WORK PACKAGE

FIELD MAINTENANCE**W1 HARNESS**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Materials/Parts

Rag, Wiping (WP 0170, Item 23)
Strap, Tiedown (as required) (WP 0170, Item 33)
Tape, Electrical (WP 0170, Item 35)
Lockwasher (1)

Equipment Conditions

Gooseneck component assembly removed and W1 harness disconnected from gooseneck component assembly terminal boards TB1 and TB2 (WP 0043)
Platform adjusted to 50 in. (127 cm) height (WP 0008)
Suspension isolation valves located at four corners of platform isolated (closed) (WP 0004)

Personnel Required

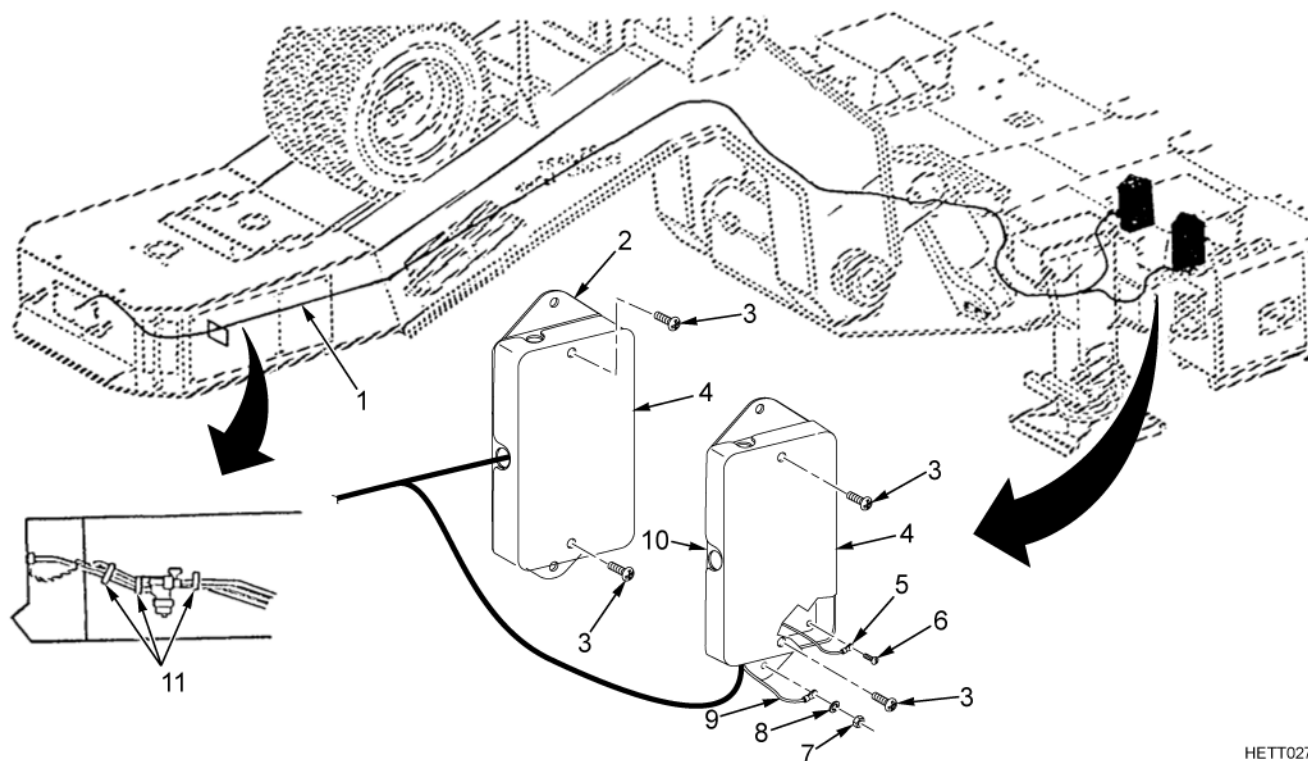
1

GENERAL INFORMATION

This work package contains instructions for the removal, repair, and installation of the W1 harness.

REMOVAL

1. Unscrew four captive screws (Figure 1, Item 3) and remove two covers (Figure 1, Item 4) from junction boxes TB1 (Figure 1, Item 2) and TB2 (Figure 1, Item 10).
2. Refer to electrical schematic rear foldout Figure FO-1 and tag and disconnect W1 harness (Figure 1, Item 1) from platform junction box terminal boards TB1 (Figure 1, Item 2) and TB2 (Figure 1, Item 10).
3. Remove nut (Figure 1, Item 7) and lockwasher (Figure 1, Item 8) from junction box TB2 (Figure 1, Item 10) mounting stud and remove white ground lead (Figure 1, Item 9) of W1 harness (Figure 1, Item 1). Discard lockwasher.
4. Remove screw (Figure 1, Item 6) securing white/blue ground lead (Figure 1, Item 5) of W1 harness (Figure 1, Item 1).
5. Cut and remove tiedown straps (Figure 1, Item 11) from W1 harness (Figure 1, Item 1) as required. Discard tiedown straps.
6. Remove all loop clamps from W1 harness (Figure 1, Item 1) (WP 0053).
7. Remove W1 harness (Figure 1, Item 1) from semitrailer.



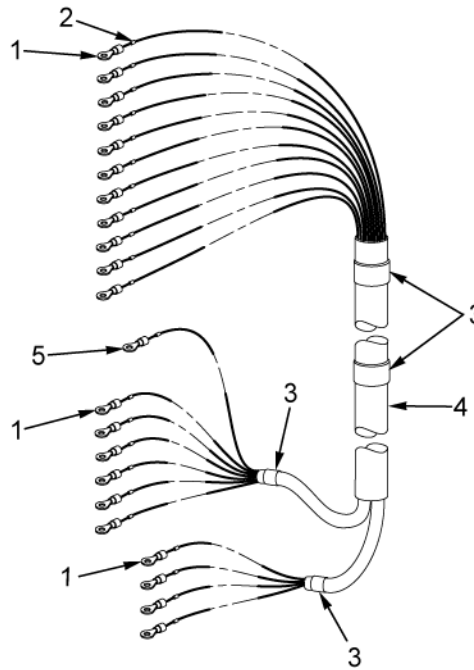
HETT0270

Figure 1. W1 Junction Boxes Removal.

END OF TASK

REPAIR

1. Inspect twenty-one terminal lugs (Figure 2, Item 1) and one terminal lug (Figure 2, Item 5) for looseness. Clean as required by wiping with a wiping rag. If loose, use electrical repair kit and remove and replace terminal lugs as required.
2. Inspect loom (Figure 2, Item 4) for breaks, cracks, and damage. If defective, replace loom portions as required. Use electrical tape at split end of loom as required.
3. Inspect for missing or unreadable harness (Figure 2, Item 3) and twenty-two wire markers (Figure 2, Item 2). If defective, apply new markings or replace markers. Refer to electrical schematic rear foldout Figure FO-1 for proper wire markings.



HETT0271

Figure 2. Terminal Lugs Repair.

END OF TASK

INSTALLATION**NOTE**

- Pull W1 harness out approximately 12 in. (30 cm) past front of gooseneck prior to securing the cable clamps.
- Place tiedown straps (Figure 3, Item 11) approximately as shown to secure wiring harness to air lines near the air filter. Additional tiedown straps may be installed as required.

1. Install W1 harness (Figure 3, Item 1) onto gooseneck and platform.
2. Refer to electrical schematic rear foldout Figure FO-1 and reconnect W1 harness (Figure 3, Item 1) to platform junction box terminal boards TB1 (Figure 3, Item 2) and TB2 (Figure 3, Item 10).
3. Attach white/blue ground lead (Figure 3, Item 5) of W1 harness (Figure 3, Item 1) to junction box TB2 (Figure 3, Item 10) using screw (Figure 3, Item 6).
4. Attach white ground lead (Figure 3, Item 9) of W1 harness (Figure 3, Item 1) to junction box TB2 (Figure 3, Item 10) mounting stud with lockwasher (Figure 3, Item 8) and nut (Figure 3, Item 7).
5. Reinstall new tiedown straps (Figure 3, Item 11) as required.
6. Secure harness in place by installing harness back into loop clamps (WP 0053).
7. Install two covers (Figure 3, Item 4) and secure with four captive screws (Figure 3, Item 3).

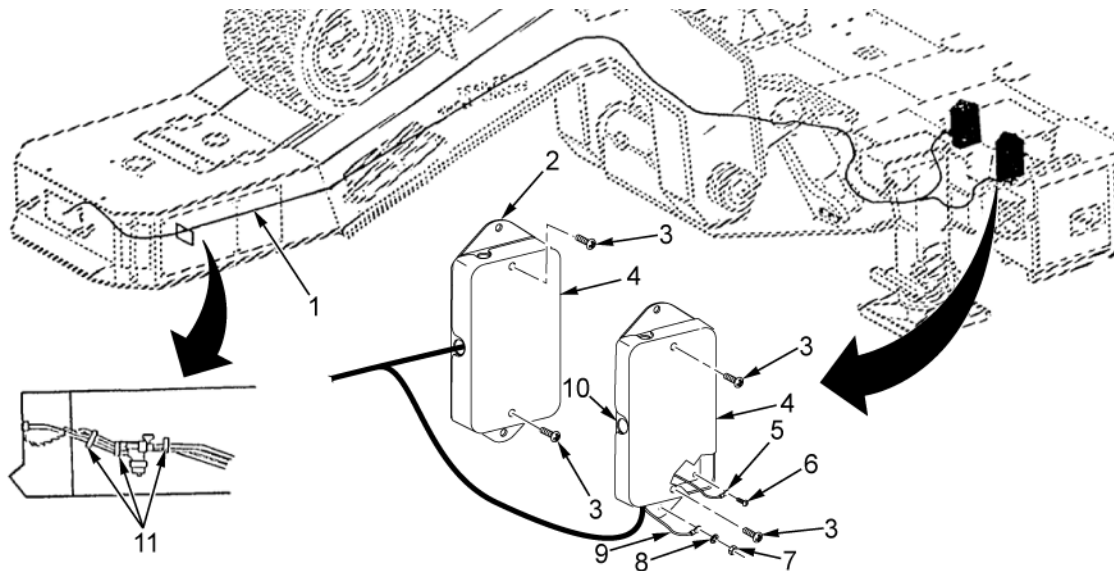


Figure 3. W1 Harness to Gooseneck and Platform.

END OF TASK**FOLLOW-ON MAINTENANCE**

Connect intervehicular cables and check all lights on semitrailer for proper operation (WP 0013).

END OF WORK PACKAGE

FIELD MAINTENANCE**W2 HARNESS**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Personnel Required

1

Materials/Parts

Rag, Wiping (WP 0170, Item 23)
Strap, Tiedown (as required) (WP 0170, Item 33)
Tape, Electrical (WP 0170, Item 35)

Equipment Conditions

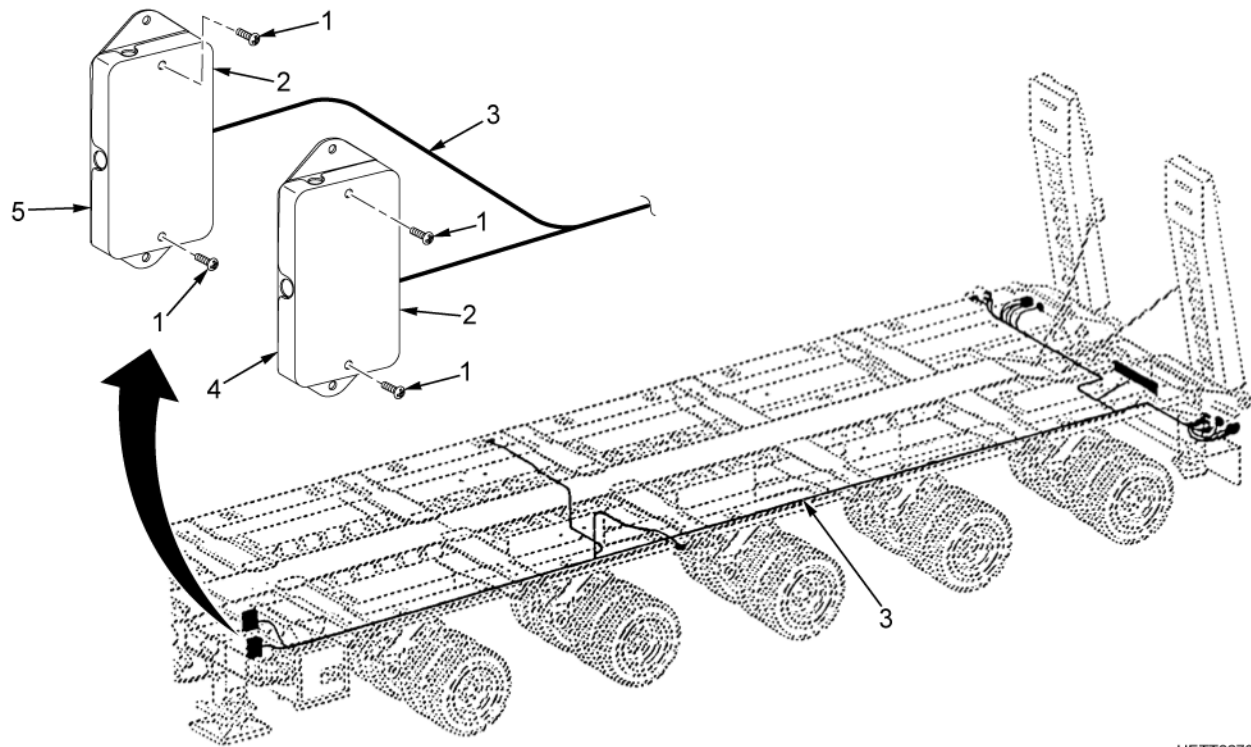
Intervehicular cable disconnected (WP 0013)
Platform adjusted to 50 in. (127 cm) height (WP 0008)
Suspension isolation valves located at four corners of
platform isolated (closed) (WP 0004)

GENERAL INFORMATION

This work package contains instructions for the removal, repair, and installation of the W2 harness.

REMOVAL

1. Unscrew four captive screws (Figure 1, Item 1) and remove two covers (Figure 1, Item 2) from junction boxes TB1 (Figure 1, Item 5) and TB2 (Figure 1, Item 4).
2. Refer to electrical schematic Figure FO-1 and tag and disconnect W2 harness (Figure 1, Item 3) from platform junction box terminal boards TB1 (Figure 1, Item 5) and TB2 (Figure 1, Item 4).
3. Cut and remove tiedown straps from W2 harness (Figure 1, Item 3) as required. Discard tiedown straps.
4. Remove all loop clamps from W2 harness (Figure 1, Item 3) (WP 0053).
5. Remove W2 harness (Figure 1, Item 3) from semitrailer.



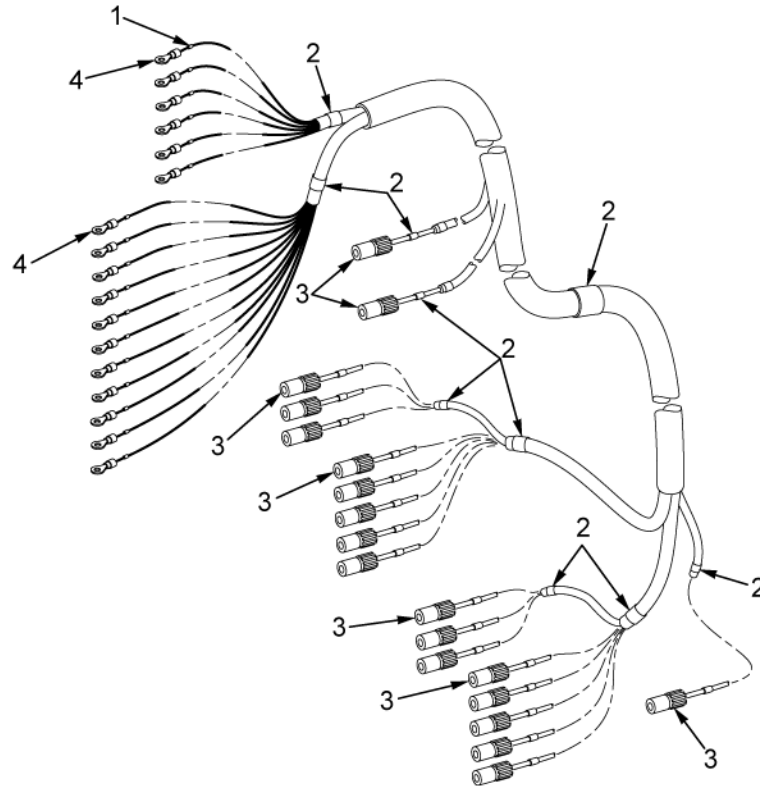
HETT0273

Figure 1. Junction Boxes TB1 and TB2 Removal.

END OF TASK

REPAIR

1. Inspect terminal lugs (Figure 2, Item 4) and electrical plug connectors (Figure 2, Item 3) for looseness. Clean as required by wiping with a wiping rag. If loose or defective, apply new markings and use electrical repair kit to replace terminal lugs and/or electrical plug connectors.
2. Inspect loom for breaks, cracks, and damage. If defective, replace loom portions as required. Use electrical tape at split ends of loom as required.
3. Inspect for missing or unreadable harness in ten places (Figure 2, Item 2) and wire markers in seventeen places (Figure 2, Item 1). If defective, apply new markings or replace markers. Use semitrailer electrical schematic rear foldout Figure FO-1 as a guide for proper wire markings.



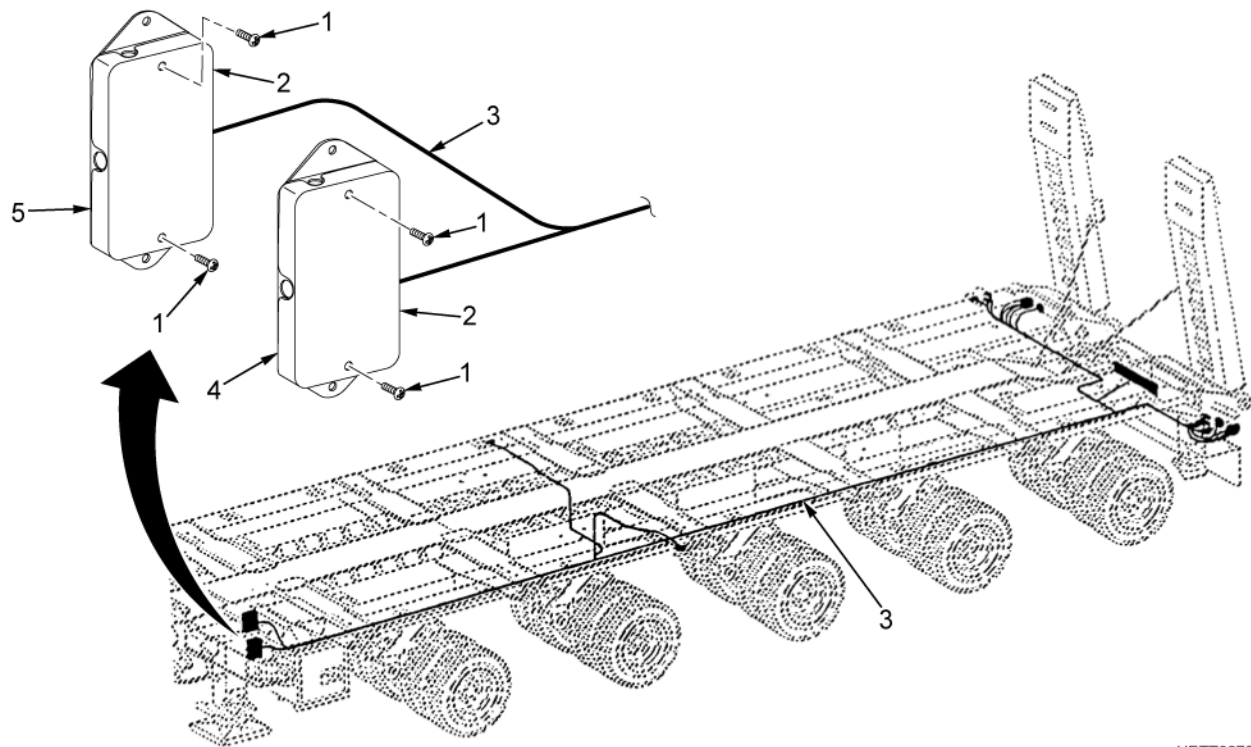
HETT0274

Figure 2. Terminal Lugs Repair.

END OF TASK

INSTALLATION

1. Install W2 harness (Figure 3, Item 3) onto platform.
2. Refer to electrical schematic rear foldout Figure FO-1 and reconnect socket connectors for W2 harness (Figure 3, Item 3) to platform lights.
3. Refer to electrical schematic rear foldout Figure FO-1 and reconnect W2 harness (Figure 3, Item 3) to platform junction box terminal boards TB1 (Figure 3, Item 5) and TB2 (Figure 3, Item 4).
4. Reinstall new tiedown straps as required.
5. Secure harness in place by installing harness back into loop clamps (WP 0053).
6. Install two covers (Figure 3, Item 2) on junction boxes (Figure 3, Item 5 and Item 4), and then secure with four captive screws (Figure 3, Item 1).



HETT0275

Figure 3. W2 Harness Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Connect intervehicular cables and check all lights on semitrailer for proper operation (WP 0013).

END OF WORK PACKAGE

FIELD MAINTENANCE**W3 HARNESS**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Personnel Required

1

Materials/Parts

Rag, Wiping (WP 0170, Item 23)
Strap, Tiedown (as required) (WP 0170, Item 33)
Tape, Electrical (WP 0170, Item 35)

Equipment Conditions

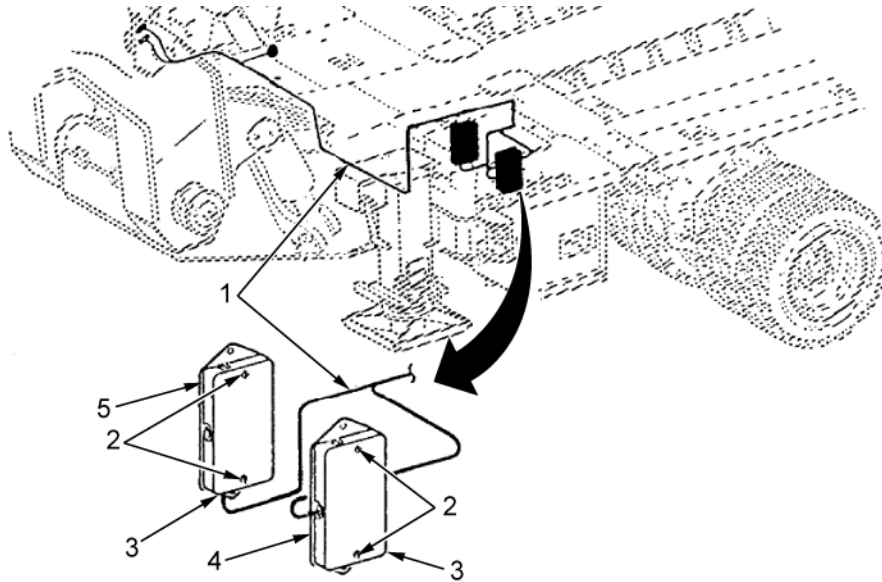
Platform adjusted to 50 in. (127 cm) height (WP 0008)
Suspension isolation valves located at four corners of
platform isolated (closed) (WP 0004)

GENERAL INFORMATION

This work package contains instructions for the removal, repair, and installation of the W3 harness.

REMOVAL

1. Unscrew four captive screws (Figure 1, Item 2) and remove two covers (Figure 1, Item 3) from junction boxes TB1 (Figure 1, Item 5) and TB2 (Figure 1, Item 4).
2. Refer to electrical schematic rear foldout Figure FO-1 for incandescent lights or Figure FO-1.1 for LED lights and tag and disconnect W3 harness (Figure 1, Item 1) from platform junction box terminal boards TB1 (Figure 1, Item 5) and TB2 (Figure 1, Item 4).
3. Tag and disconnect socket connectors for W3 harness (Figure 1, Item 1) from platform lighting.
4. Remove all loop clamps from W3 harness (Figure 1, Item 1) (WP 0053).
5. Cut and remove tiedown straps from W3 harness (Figure 1, Item 1) as required. Discard tiedown straps.
6. Remove W3 harness (Figure 1, Item 1) from semitrailer.



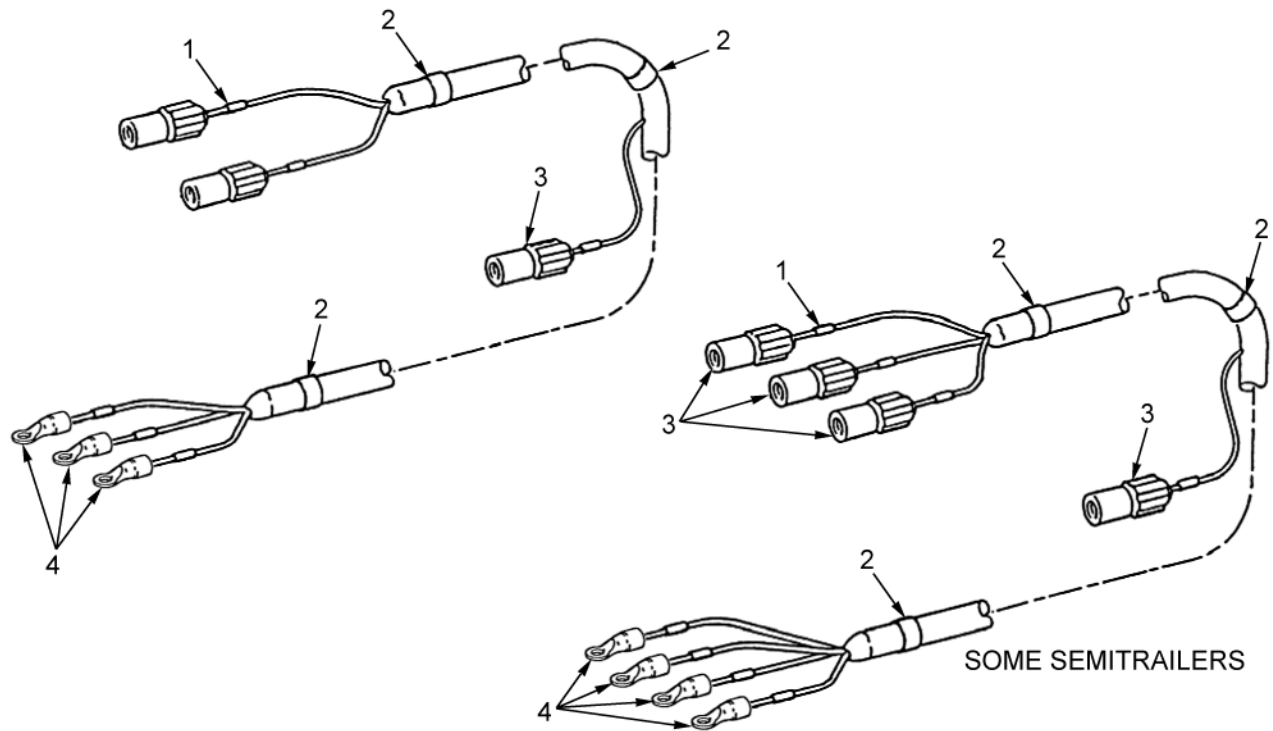
HETT0278

Figure 1. W3 Harness Removal.

END OF TASK

REPAIR

1. Inspect terminal lugs (Figure 2, Item 4) and electrical plug connectors (Figure 2, Item 3) for frayed or broken wires and looseness. Clean as required by wiping with a wiping rag. If defective, use electrical repair kit and replace as required.
2. Inspect loom for breaks, cracks, and damage. If defective, repair defective loom as required. Use electrical tape at split ends of loom as required.
3. Inspect for missing or unreadable harness and wire markers (Figure 2, Item 2 and Item 1). If defective, apply new markings or replace markers. Use electrical schematic rear foldout Figure FO-1 for incandescent lights or Figure FO-1.1 for LED lights for proper wire markings.



HETT0277

Figure 2. Terminal Lugs Repair.

END OF TASK

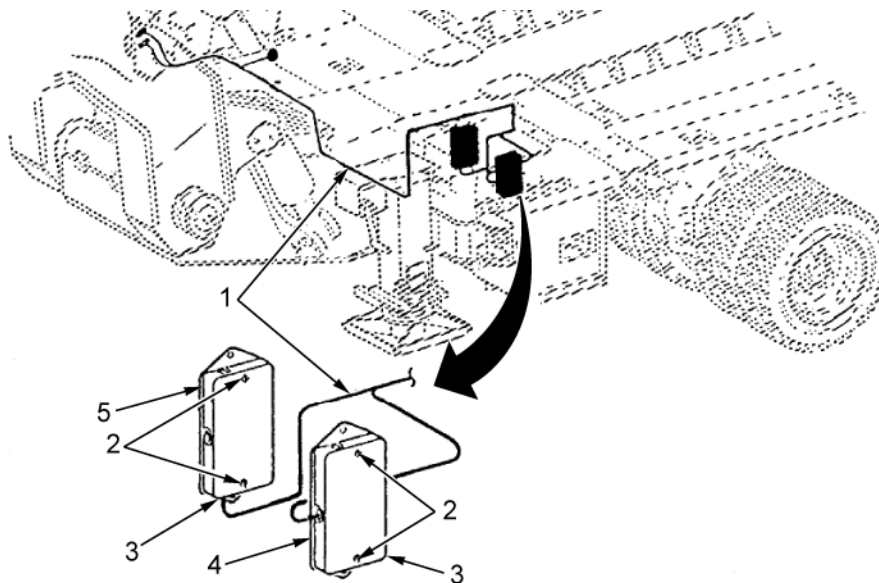
INSTALLATION

1. Install W3 harness (Figure 3, Item 1) onto platform.
2. Refer to electrical schematic rear foldout Figure FO-1 for incandescent lights or Figure FO-1.1 for LED lights and reconnect socket connectors for W3 harness (Figure 3, Item 1) to platform lighting.
3. Refer to electrical schematic rear foldout Figure FO-1 for incandescent lights or Figure FO-1.1 for LED lights and reconnect W3 harness (Figure 3, Item 1) to platform junction box terminal boards TB1 (Figure 3, Item 5) and TB2 (Figure 3, Item 4).

NOTE

Tiedown straps should be placed in a logical position to secure wiring harness.

4. Reinstall new tiedown straps as required.
5. Secure harness in place by installing harness back into loop clamps (WP 0053).
6. Install two covers (Figure 3, Item 3) on junction boxes TB1 (Figure 3, Item 5) and TB2 (Figure 3, Item 4) and secure with four captive screws (Figure 3, Item 2).



HETT0278

Figure 3. Platform Junction Boxes Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Couple semitrailer and towing vehicle (WP 0013) and check lights for proper operation.

END OF WORK PACKAGE

FIELD MAINTENANCE

W4 HARNESS

INITIAL SETUP:

Tools and Special Tools

- General Mechanic's Tool Kit (WP 0168, Item 11)
- Standard Army Tool Set (WP 0168, Item 28)

Personnel Required

2

Materials/Parts

- Rag, Wiping (WP 0170, Item 23)
- Strap, Tiedown (as required) (WP 0170, Item 33)
- Tape, Electrical (WP 0170, Item 35)

Equipment Conditions

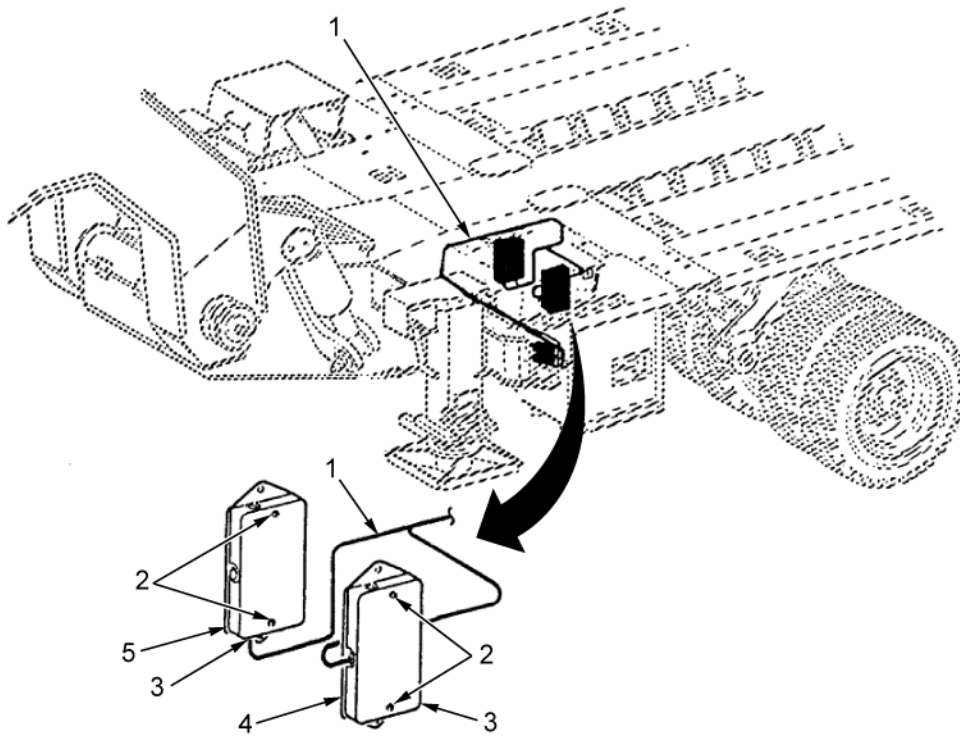
- Intervehicular cable disconnected (WP 0013)
- Platform adjusted to 50 in. (127 cm) height (WP 0008)
- Suspension isolation valves located at four corners of platform isolated (closed) (WP 0004)

GENERAL INFORMATION

This work package contains instructions for the removal, repair, and installation of the W4 harness.

REMOVAL

1. Unscrew four captive screws (Figure 1, Item 2) and remove two covers (Figure 1, Item 3) from junction boxes TB1 (Figure 1, Item 5) and TB2 (Figure 1, Item 4).
2. Refer to electrical schematic rear foldout Figure FO-1 for incandescent lights or Figure FO-1.1 for LED lights and tag and disconnect W4 harness (Figure 1, Item 1) from platform junction box terminal boards TB1 (Figure 1, Item 5) and TB2 (Figure 1, Item 4).
3. Tag and disconnect socket connectors for W4 harness (Figure 1, Item 1) from platform lighting.
4. Remove all loop clamps from W4 harness (Figure 1, Item 1) (WP 0053).
5. Cut and remove all tiedown straps from W4 harness (Figure 1, Item 1) as required. Discard tiedown straps.
6. Remove W4 harness (Figure 1, Item 1) from semitrailer platform.



HETT0279

Figure 1. W4 Harness Removal.

END OF TASK

REPAIR

1. Inspect terminal lugs (Figure 2, Item 3) and electrical plug connectors (Figure 2, Item 4) for frayed or broken wires and looseness. Clean lugs as required by wiping with a wiping rag. If lugs are defective, use electrical repair kit to replace lugs as required.
2. Inspect loom for breaks, cracks, and damage. If defective, repair defective loom as required. Use electrical tape at split ends of loom as required.
3. Inspect for missing or unreadable harness and wire markers (Figure 2, Item 2 and Item 1). If defective, apply new markings or replace markers. Refer to electrical schematic rear foldout Figure FO-1 for incandescent lights or Figure FO-1.1 for LED lights for proper wire markings.

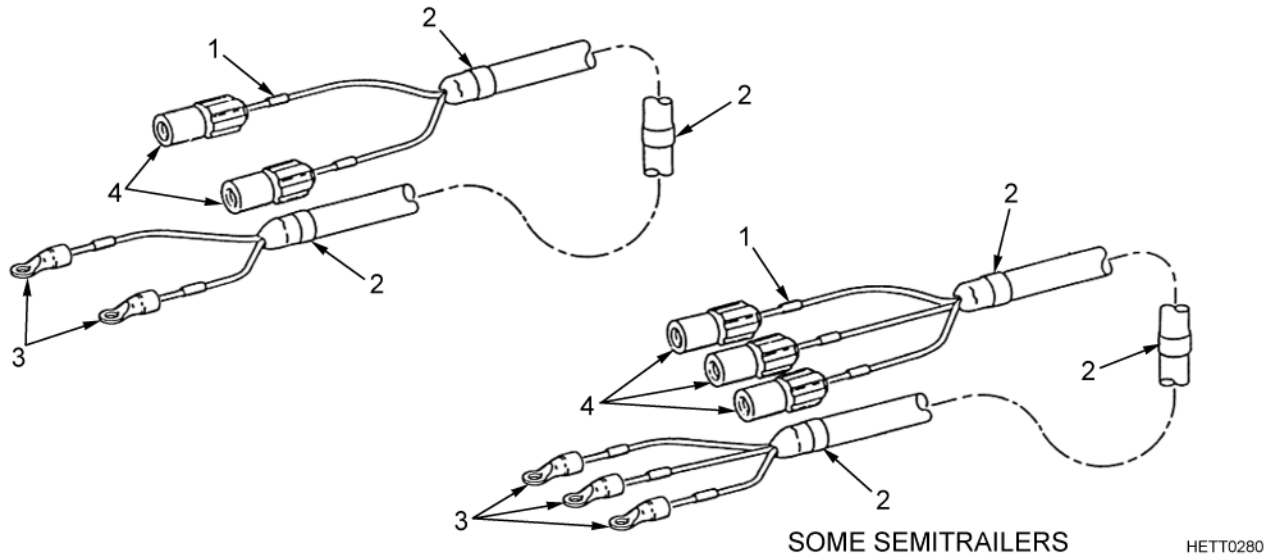


Figure 2. Wire and Terminal Lugs Repair.

END OF TASK

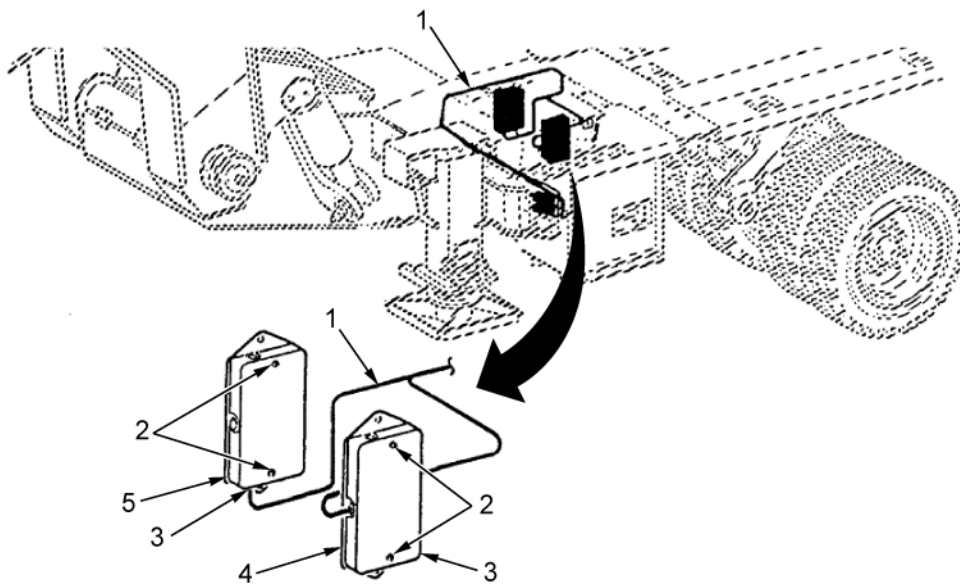
INSTALLATION

1. Install W4 harness (Figure 3, Item 1) onto platform.
2. Refer to electrical schematic rear foldout Figure FO-1 for incandescent lights or Figure FO-1.1 for LED lights and reconnect socket connectors for W4 harness (Figure 3, Item 1) to platform lighting.
3. Refer to electrical schematic rear foldout Figure FO-1 for incandescent lights or Figure FO-1.1 for LED lights and reconnect W4 harness (Figure 3, Item 1) to platform junction box terminal boards TB1 (Figure 3, Item 5) and TB2 (Figure 3, Item 4).

NOTE

Place tiedown straps in a logical position to secure wiring harness.

4. Reinstall new tiedown straps as required.
5. Secure harness in place by installing harness back into loop clamps (WP 0055).
6. Install two covers for incandescent lights or for LED lights and reconnect W4 harness (Figure 3, Item 1) to platform junction box terminal boards TB1 (Figure 3, Item 5) and TB2 (Figure 3, Item 4) and secure covers (Figure 3, Item 3) with four captive screws (Figure 3, Item 2).



HETT0281

Figure 3. W4 Harness Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Couple semitrailer and towing vehicle (WP 0013).

END OF WORK PACKAGE

FIELD MAINTENANCE**W5 HARNESS (SOME SEMITRAILERS)**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Personnel Required

2

Materials/Parts

Rag, Wiping (WP 0170, Item 23)
Strap, Tiedown (as required) (WP 0170, Item 33)
Tape, Electrical (WP 0170, Item 35)
Locknuts (2)

Equipment Conditions

Intervehicular cable disconnected (WP 0013)
Gooseneck adjusted fully down or coupled to tractor
(WP 0007 and WP 0013)

GENERAL

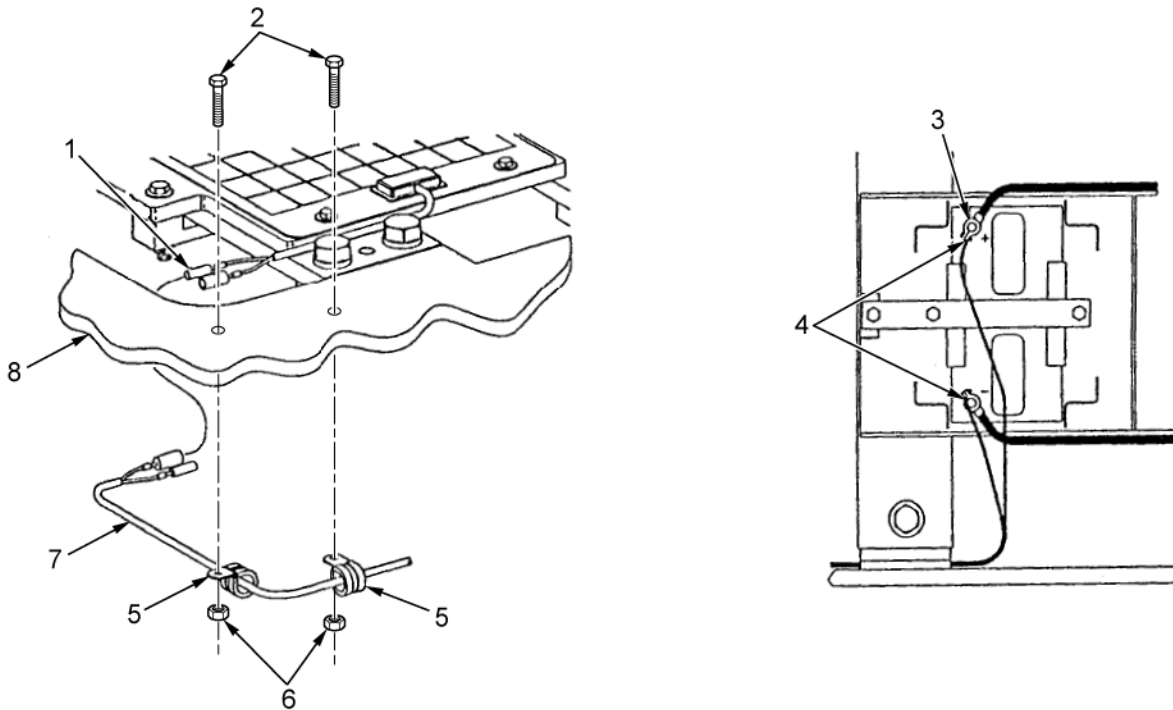
This work package contains instructions for removal, repair, and installation of the W5 harness (some semitrailers).

REMOVAL

WARNING

On some semitrailers a solar battery charger is mounted to the top of the gooseneck directly in front of spare tires. Persons working on top of the gooseneck must take EXTREME care not to step on the gooseneck or trip over it. Failure to follow this warning may result in injury to personnel or damage to equipment.

1. Refer to electrical schematic rear foldout FO-1 and disconnect solar panel leads (Figure 1, Item 1) from W5 harness (Figure 1, Item 7). At battery, disconnect W5 harness leads (Figure 1, Item 4) from battery terminals (Figure 1, Item 3).
2. Remove two locknuts (Figure 1, item 6), screws (Figure 1, Item 2), and clamps (Figure 1, Item 5) from gooseneck (Figure 1, Item 8). Discard locknuts.



HETT0282

Figure 1. W5 Harness Removal.

3. Cut tiedown straps securing W5 harness (Figure 2 item 1) to W1 harness (Figure 2 item 2). Remove W5 harness from gooseneck (Figure 2 item 3).

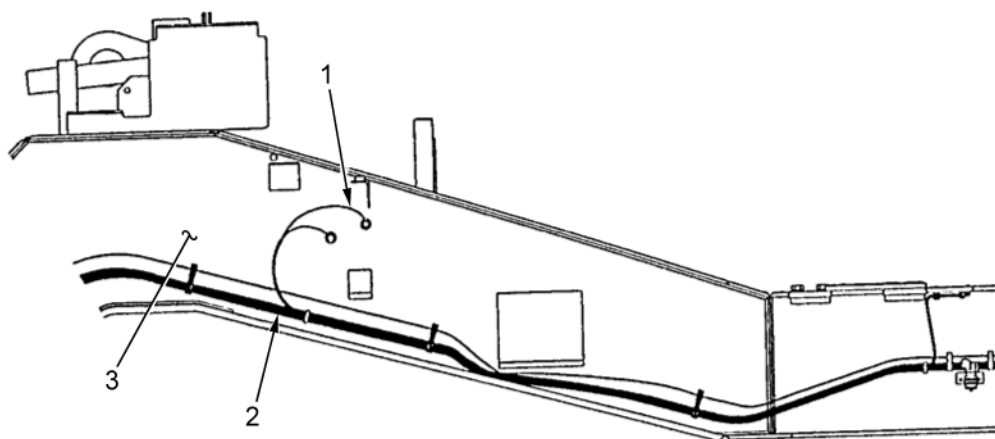


Figure 2. W5 Harness Removal.

END OF TASK

REPAIR

1. Inspect terminal lugs and electrical plug connectors for frayed or broken wires and looseness. Clean lugs by wiping with a rag. If lugs are defective, use electrical repair kit to replace lugs as required.
2. Inspect loom for breaks, cracks, and damage. If defective, repair defective loom as required. Use electrical tape at split ends of loom as required.
3. Inspect for missing or unreadable harness and wire markers. If defective, apply new markers or replace markers. Use electrical schematic rear foldout FO-1.1 for proper wire markings.

END OF TASK

INSTALLATION

1. Position W5 harness (Figure 3, Item 1) in gooseneck (Figure 3, Item 3) and loosely fasten W5 harness to W1 harness (Figure 3, Item 2) with tiedown straps.

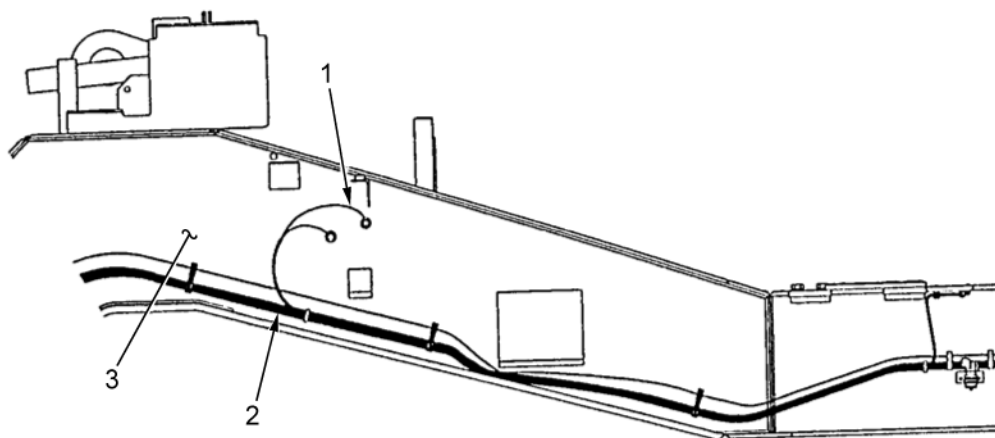
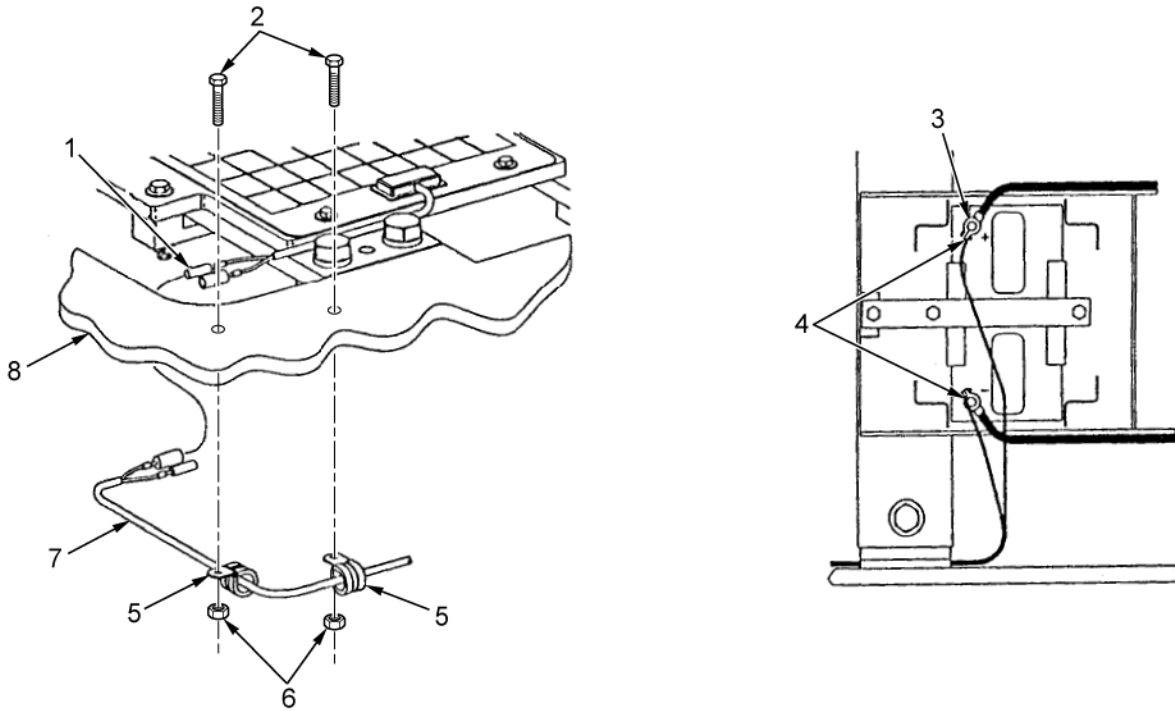


Figure 3. W5 Harness Installation.

2. Refer to electrical schematic rear foldout FO-1.1 and connect solar panel leads (Figure 4, Item 1) to W5 harness (Figure 4, Item 7). At battery, connect W5 harness leads (Figure 4, Item 4) to battery terminals (Figure 4, Item 3).
3. Install two clamps (Figure 4, Item 5) to W5 harness (Figure 4, Item 7) and secure clamps using two screws (Figure 4, Item 2) and new locknuts (Figure 4, Item 6).
4. Secure W5 harness (Figure 4, Item 7) and W1 harness to gooseneck (Figure 4, Item 8) (electrical schematic rear foldout FO-1) using tiedown straps as required.



HETT0282

Figure 4. W5 Harness Installation.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**APU WIRING HARNESS**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Personnel Required

1

Materials/Parts

Rag, Wiping (WP 0170, Item 23)
Sealant, Adhesive (WP 0170, Item 24)
Strap, Tiedown (as required) (WP 0170, Item 33)
Tape, Electrical (WP 0170, Item 35)

Equipment Conditions

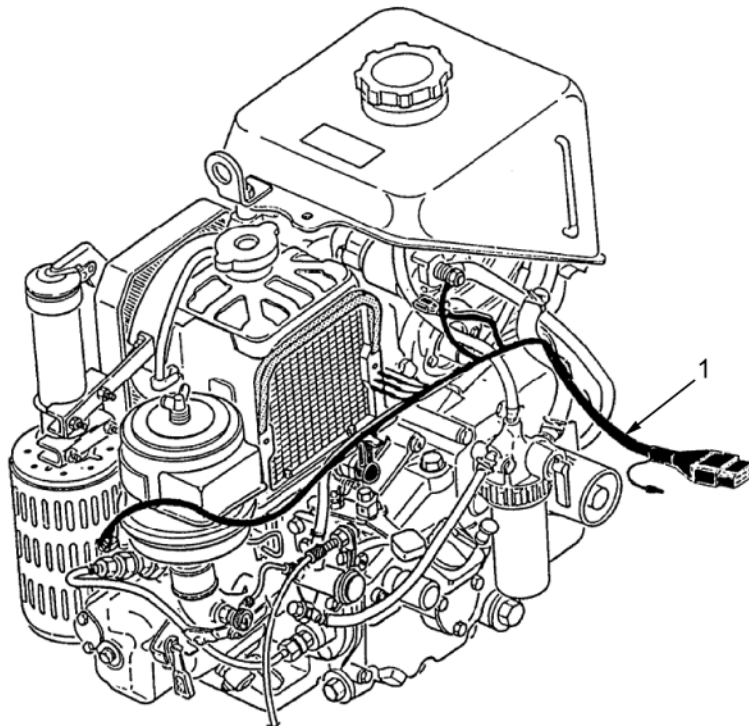
Battery ground wire removed from APU pump flange (WP 0053)
Jumper wires removed from APU control box (WP 0058)

GENERAL INFORMATION

This work package contains instructions for removal, repair, and installation of the Auxiliary Power Unit (APU) wiring harness.

REMOVAL

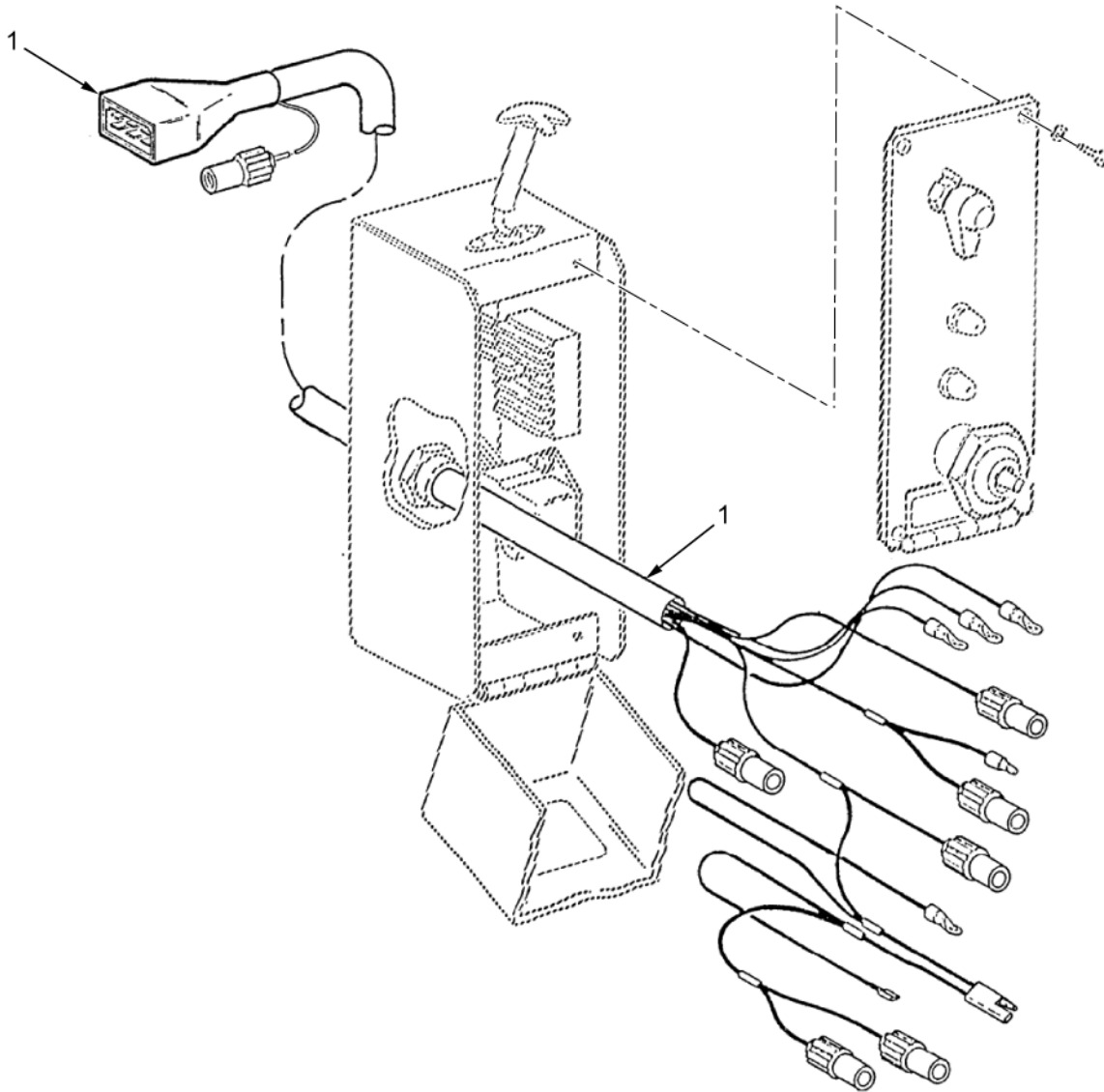
1. Use APU electrical schematic rear foldout FO-4 as a guide to tag and disconnect APU wiring harness (Figure 1, Item 1) from APU starter (WP 0146), vanaxial fan (WP 0144), glow plug (WP 0129), and oil pressure sending unit (WP 0133).



HETT0284

Figure 1. APU Wiring Harness Removal.

2. Use APU electrical schematic rear foldout FO-4 as a guide to tag and disconnect APU wiring harness (Figure 2, Item 1) from APU control box starter switch, glow plug indicator, low oil pressure indicator, current limiter, and current rectifier if applicable.
3. Refer to WP 0140 and remove all loop clamps from APU wiring harness.
4. Remove APU wiring harnesses (Figure 2, Item 1) from semitrailer gooseneck.



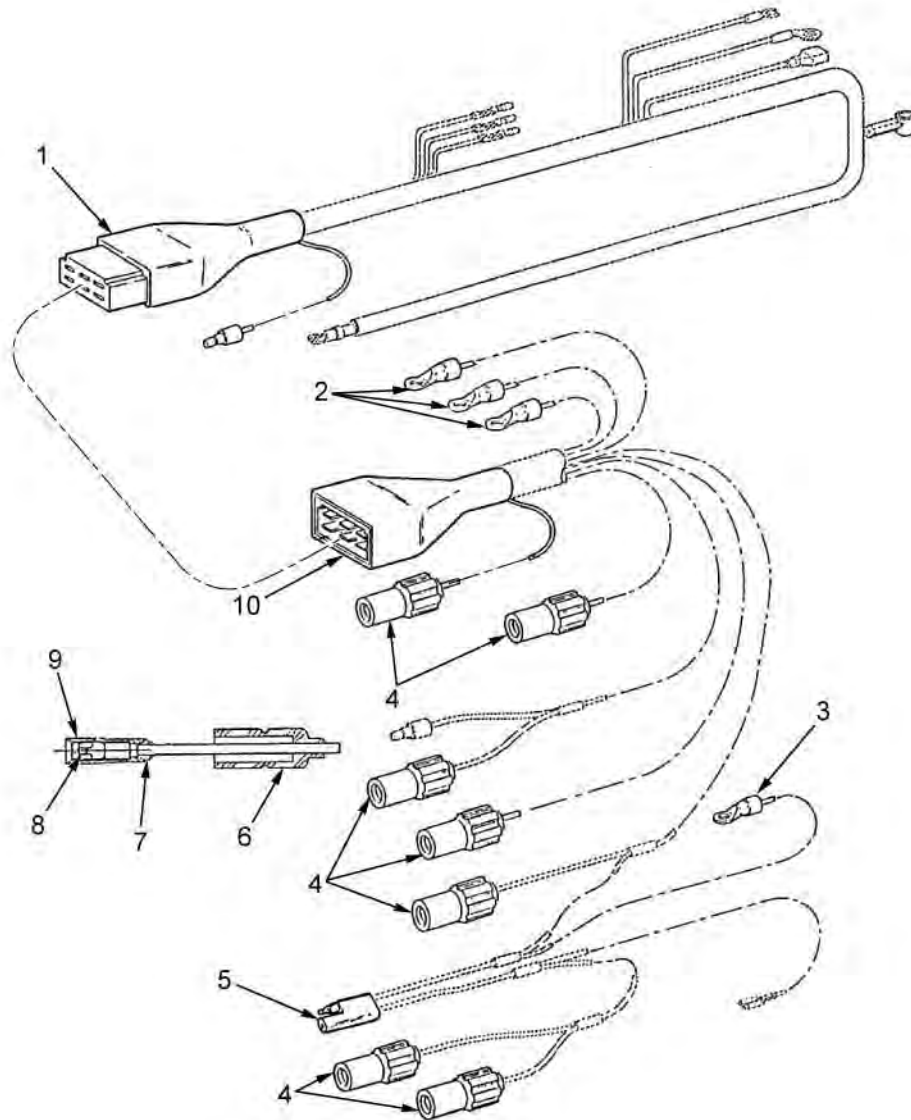
HETT0285

Figure 2. APU Harness at Control Box Removal.

END OF TASK

REPAIR

1. Inspect APU control box wiring harness (Figure 3, Item 2), terminal lugs (Figure 3, Item 10), connectors (Figure 3, Item 4), two-position connector (Figure 3, Item 5), terminal lug (Figure 3, Item 3), and APU wiring harness (Figure 3, Item 1) for frayed or broken wires and looseness. Clean parts as required by wiping with a wiping rag. If parts are defective, use electrical repair kit to replace terminal lugs, electrical plug connectors, and two-position connector as required.
2. When repairing connector (Figure 3, Item 4), apply sealant (Figure 3, Item 7) around perimeter of terminal (Figure 3, Item 8) and sleeve (Figure 3, Item 9) as shown, and then slide shell (Figure 3, Item 6) into position and allow sealant to dry.
3. Inspect both male and female harness connectors of APU control box harness (Figure 3, Item 2) and APU wiring harness (Figure 3, Item 1) for frayed or broken wires and looseness. Clean connectors as required by wiping with a wiping rag. If connectors are defective, replace the applicable APU wiring harness (Figure 3, Item 2 and Item 1) as required.



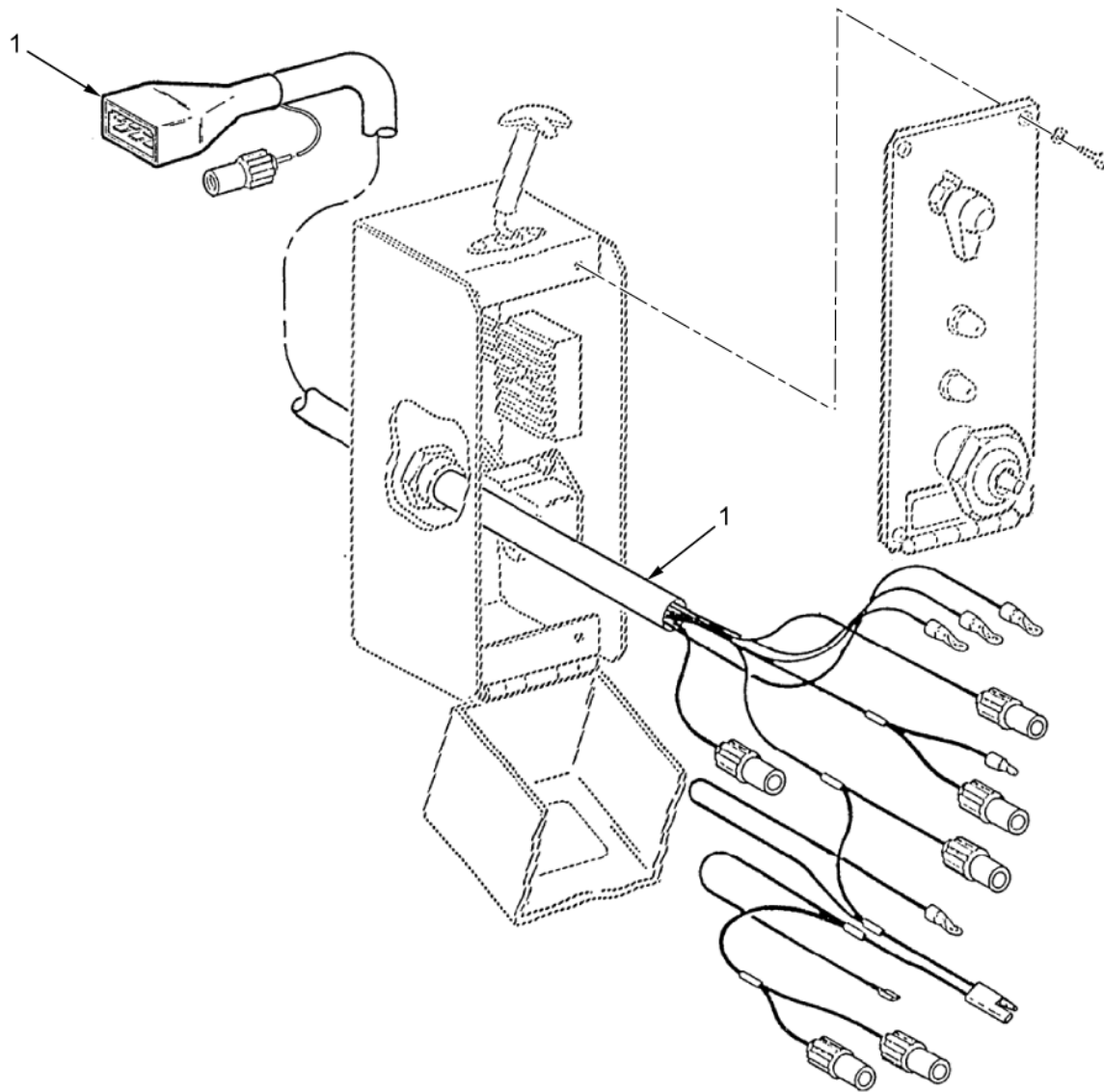
HETT0286

Figure 3. APU Control Box Wiring Harness Inspection and Repair.

END OF TASK

INSTALLATION

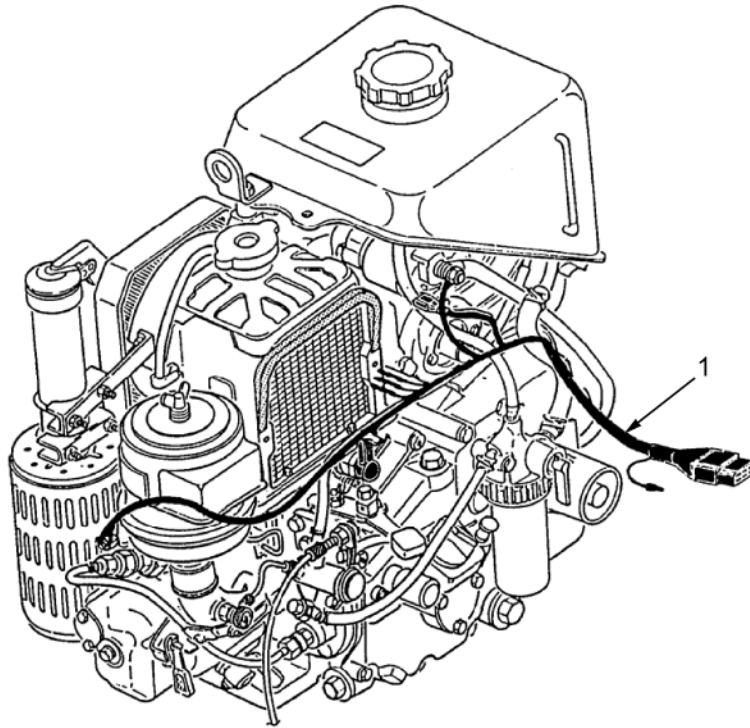
1. Install both APU wiring harnesses (Figure 4, Item 1) onto gooseneck.
2. Use APU electrical schematic rear foldout FO-4 as a guide to reconnect APU wiring harness (Figure 4, Item 1) to APU control box starter switch, glow plug indicator, oil pressure indicator, current limiter, and current rectifier, if applicable.



HETT0287

Figure 4. APU Wiring Harness Installation.

3. Use APU electrical schematic rear foldout FO-4 as a guide to reconnect APU wiring harness (Figure 5, Item 1) to APU starter (WP 0146), vanaxial fan (WP 0144), glow plug (WP 0129), and oil pressure sending unit (WP 0133).



HETT0288

Figure 5. APU Wiring Harness Installation.

NOTE

Tiedown straps should be placed in a logical position to secure wiring harness.

4. Reinstall new tiedown straps as required.
5. Secure both harnesses in place by installing each harness into loop clamps (WP 0140).

END OF TASK

FOLLOW-ON MAINTENANCE

- Reinstall jumper wires to APU control box (WP 0058).
- Reconnect battery ground wire to APU pump flange (WP 0053).
- Start and run APU and check for proper operation (WP 0005).

END OF WORK PACKAGE

FIELD MAINTENANCE

SUSPENSION ASSEMBLY/BOGIE

INITIAL SETUP:

Tools and Special Tools

Handle, Ext SPNSN ISOL Valve (WP 0168, Item 1)
Socket, Suspension Brg Nut (WP 0168, Item 3)
General Mechanic's Tool Kit (WP 0168, Item 11)
Lifting Strap (2) (WP 0168, Item 25)
Truck, Wrecker M984 (WP 0168, Item 26)
Standard Army Tool Set (WP 0168, Item 28)
Chain Assembly, 1/2 in. 11 ft L (WP 0168, Item 30)

Setscrew (1)
Oil Seal (1)
Preformed Packing (1)

Personnel Required

3

Equipment Conditions

Gooseneck isolation valve handle pulled out to ADJUST position (WP 0004)
Suspension shutoff valve handle pulled out to ADJUST position (WP 0004)
Platform adjusted to 50 in. (127 cm) height (WP 0008)
Gooseneck lowered to lowest position, if uncoupled (WP 0007)
Brakes caged for affected suspension assembly (WP 0023)
Semitrailer parking brakes applied (WP 0004)

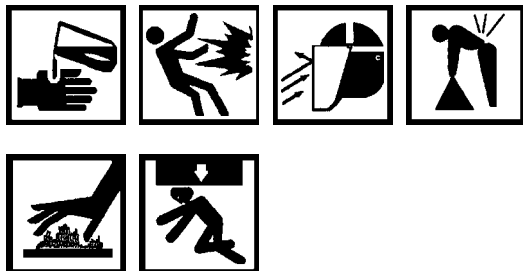
Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Grease (WP 0170, Item 16)
Rag, Wiping (WP 0170, Item 23)
Solvent, Cleaning Compound (WP 0170, Item 31)
Tape, Masking (WP 0170, Item 36)
Locknut (1)

GENERAL INFORMATION

This work package contains instructions for removal and installation of the suspension assembly/bogie.

REMOVAL

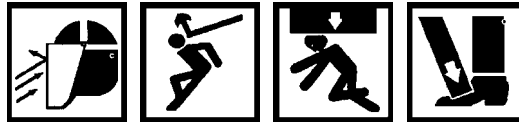
WARNING

- Hydraulic fluid may be hot if the system has been in operation. Allow the system time to cool before performing maintenance, or severe injury or burns to personnel may result.
- Hydraulic fluid may be under pressure. Use caution when disconnecting hydraulic lines or components. Face shields or goggles must be worn or serious injury to personnel may result.
- Hydraulic fluid can be absorbed through the skin. Wear long sleeves, gloves, goggles, or face shield. If hydraulic fluid gets into eyes, flush them immediately with water and seek medical attention. If hydraulic fluid gets on skin, thoroughly wash with soap and water. Wash hands prior to eating or smoking.
- The suspension assembly, herein after referred to as bogie, weighs approximately 2,500 lb (1135 kg). Extreme caution must be used during removal and installation of the bogie or serious injury to personnel or damage to equipment may result.
- The bogie must be supported with an overhead lifting device during removal and installation procedure or serious injury to personnel or damage to equipment may result.
- Suspension isolation valves must be closed at four corners of the platform (no. 1 and no. 5 curbside and no. 1 and no. 5 streetside bogies). If the affected bogie is one of the four corner bogies, close the valve at the next adjacent bogie. Failure to follow this warning may result in injury to personnel or damage to equipment.

NOTE

Use this task for access only for five-year service procedure.

1. Use isolation valve handle extension to isolate bogies at four corners by closing suspension isolation valves (Figure 1, Item 1); ensure handles face outboard from center of platform.
2. Loosen and remove setscrew (Figure 1, Item 4) from spanner nut (Figure 1, Item 3). Discard setscrew.

WARNING

While installing spanner socket on spanner nut, use one person to hold spanner socket in place or the spanner socket may fall. Failure to follow this warning may result in injury to personnel or damage to equipment.

3. Install spanner socket (Figure 1, Item 5) onto spanner nut (Figure 1, Item 3). Use one person to hold spanner socket in place and one person to install torque multiplier and torque wrench.

CAUTION

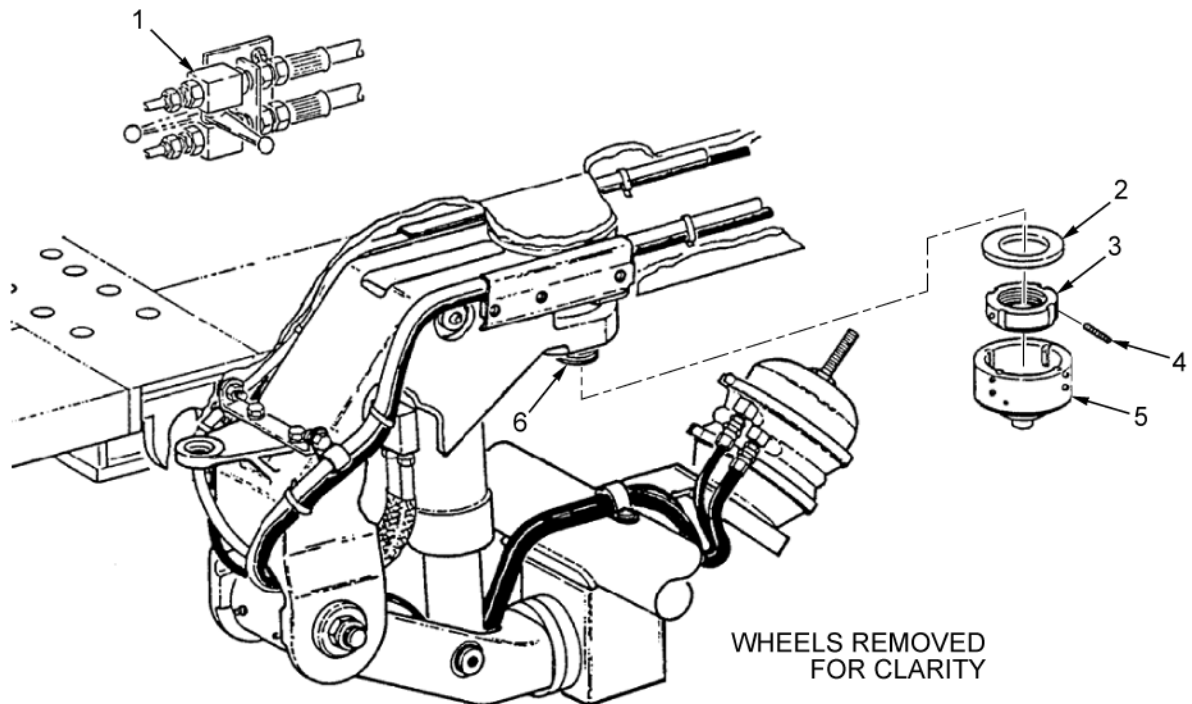
Threads on the platform spindle must be protected prior to removal of the lower suspension bearing or damage to the spindle may result.

4. Loosen spanner nut (Figure 1, Item 3) until spanner socket (Figure 1, Item 5) can be turned by hand. Remove torque wrench and torque multiplier from spanner socket, and then loosen spanner nut using a ratchet only.
5. Remove ratchet, spanner socket (Figure 1, Item 5), spanner nut (Figure 1, Item 3), and spacer (Figure 1, Item 2) from platform spindle (Figure 1, Item 6).

CAUTION

Remove setscrew from spanner nut or damage to equipment may result.

6. Apply masking tape to the threads of the platform spindle (Figure 1, Item 6) to protect the threads from accidental damage.



HETT0289

Figure 1. Bogie View with Wheel Removed.

7. For removal of no. 2, 3, 4, or 5 bogie connecting link, remove special pin (Figure 2, Item 4), nut (Figure 2, Item 5), and capscrew (Figure 2, Item 2) from connecting link (Figure 2, Item 1).

CAUTION

Push steering or non-steering connecting link forward, toward the front of the semitrailer, to allow the bogie to rotate, or damage to equipment may result.

8. Use pry bar to pry up and move connecting link (Figure 2, Item 1) off affected bogie (Figure 2, Item 3). Push connecting link forward, away from bogie, and align and install capscrew (Figure 2, Item 2), nut (Figure 2, Item 5), and special pin (Figure 2, Item 4) back onto connecting link for temporary storage.

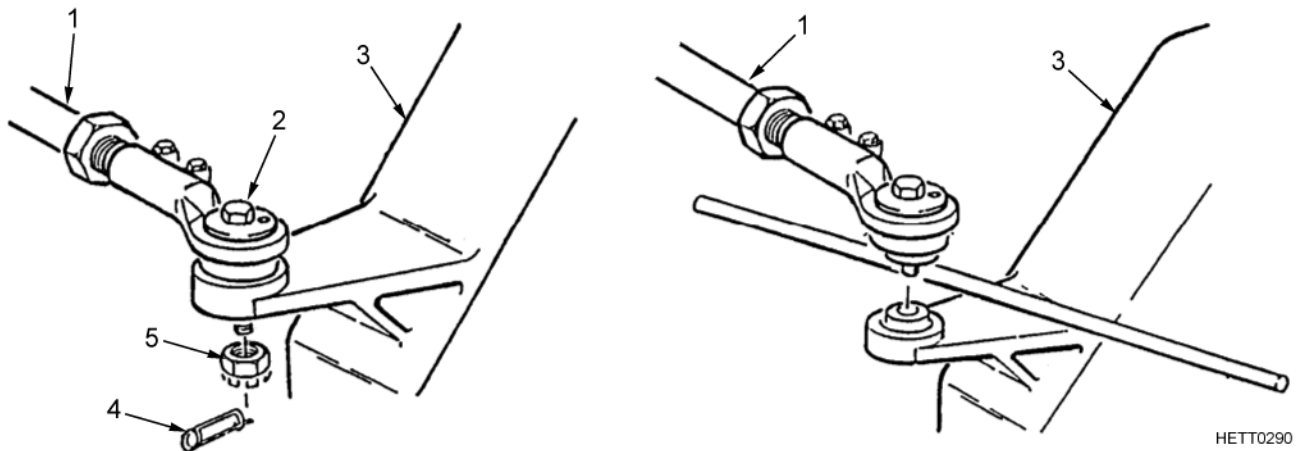


Figure 2. Disconnecting Connecting Link on No. 2, 3, 4, or 5 Bogie.

9. For removal of no. 1 bogie connecting link, remove special pin (Figure 3, Item 5), nut (Figure 3, Item 6), and capscrew (Figure 3, Item 2) from connecting link (Figure 3, Item 1).

CAUTION

Push steering or non-steering connecting link forward, toward the front of the semitrailer, to allow the bogie to rotate, or damage to equipment may result.

10. Use pry bar to pry up and move connecting link (Figure 3, Item 1) off affected bogie (Figure 3, Item 3). Push connecting link forward, away from bogie, and align and install capscrew (Figure 3, Item 2), nut (Figure 3, Item 6), and special pin (Figure 3, Item 5) back onto connecting link for temporary storage.
11. If no. 1 bogie connecting link (Figure 3, Item 1) was disconnected, remove preformed packing (Figure 3, Item 4) from link. Discard preformed packing.

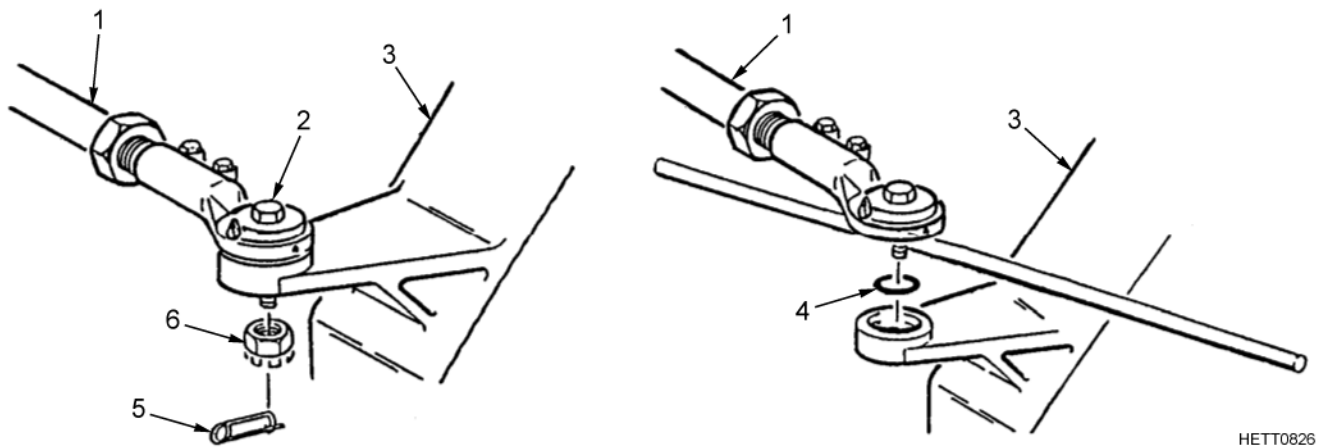


Figure 3. Disconnecting Connecting Link on No. 1 Bogie.

12. Remove block clamp sections (Figure 4, Item 4) from two hydraulic hoses (Figure 4, Item 2) per steps a and b.
 - a. For bogies no. 1, 2, 3, or 5, remove capscrew (Figure 4, Item 3) and block clamp sections (Figure 4, Item 4) from bogie.
 - b. For bogie no. 4, remove locknut (Figure 4, Item 5), capscrew (Figure 4, Item 6), and block clamp sections (Figure 4, Item 4) from bogie. Discard locknut.
13. Use isolation valve handle extension to open isolation valves (Figure 4, Item 1) at all four corners of platform (WP 0004).
14. Start Auxiliary Power Unit (APU) (WP 0005). Use measuring tape to lower platform height to approximately 41 in. (108 cm) (WP 0008).

WARNING



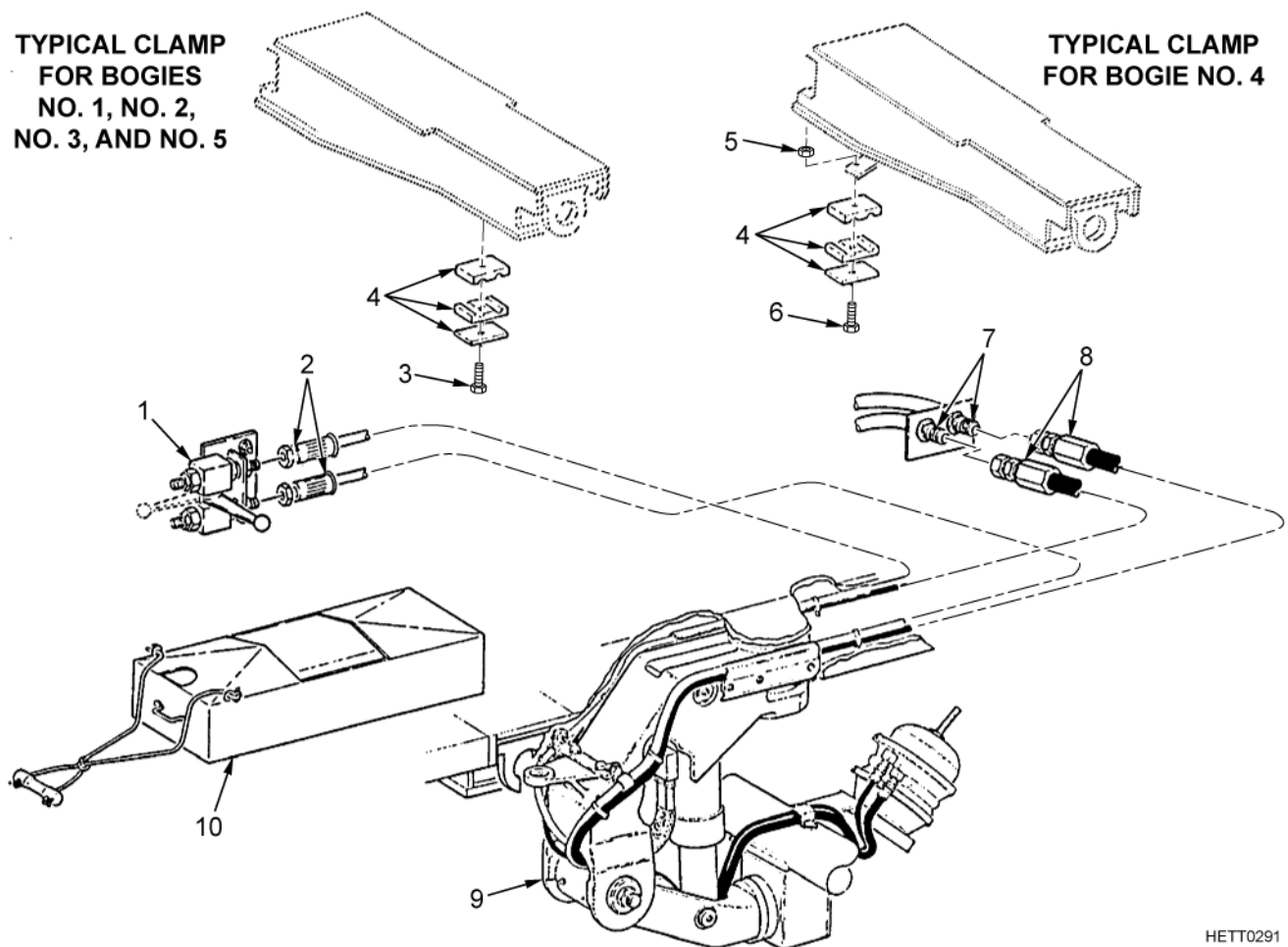
Air system must be drained prior to pneumatic lines being disconnected or inadvertent operation of the semitrailer brake valve during platform adjustments may result in injury to personnel.

15. Operate brake valve (WP 0004) several times until all reserve air is drained from air tanks.
16. At affected bogie, use isolation valve handle extension to close suspension isolation valve (Figure 4, Item 1); ensure handle faces outboard from center of platform.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or foreign material from entering the hydraulic or pneumatic systems, or damage to equipment may result.

17. Place drain pan (Figure 4, Item 10) under suspension isolation valve (Figure 4, Item 1). Tag and disconnect two hydraulic hoses (Figure 4, Item 2) from suspension isolation valve at affected bogie (Figure 4, Item 9). Install caps/plugs into openings on isolation valve. Place ends of hose into opening in drain pan and secure hose in place using masking tape.
18. Tag and disconnect two pneumatic hoses (Figure 4, Item 8) from two bulkhead fittings (Figure 4, Item 7). Install caps/plugs into all openings.



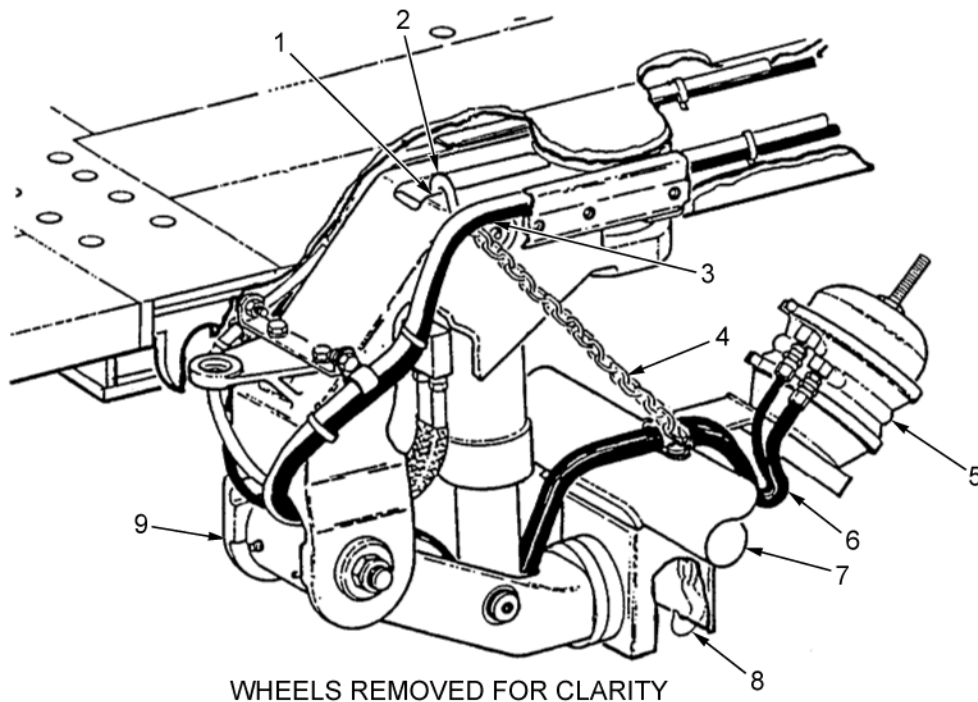
HETT0291

Figure 4. Block Clamp from Hydraulic Hoses Removal.

CAUTION

When securing hook to upper suspension arm, ensure suspension chain does not contact any hydraulic or pneumatic hoses. If contact is made, chafing or parting of a line/hose, loss of air brake pressure, loss of hydraulic fluid, or damage to equipment may result.

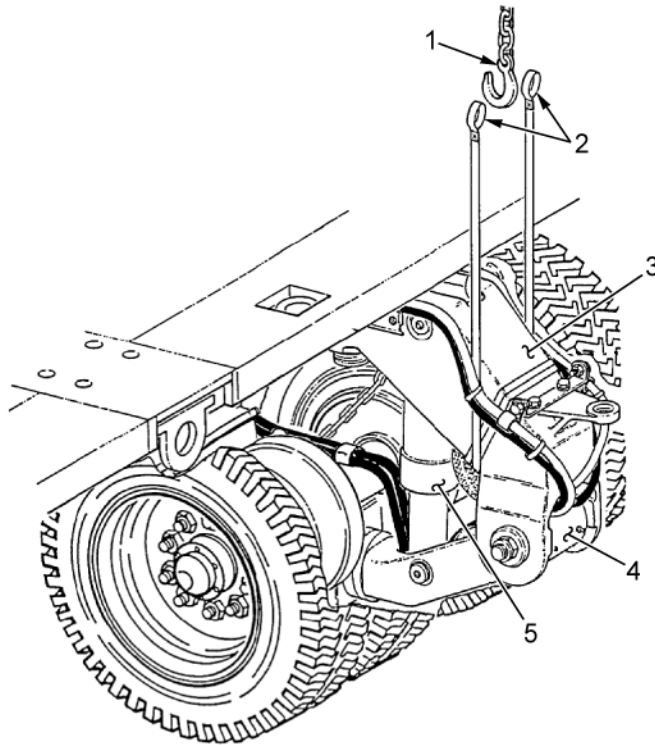
19. Attach suspension chain (Figure 5, Item 4) to affected bogie (Figure 5, Item 9) as follows:
 - a. Attach top hook (Figure 5, Item 2) of suspension chain (Figure 5, Item 4), located along outboard side of bogie (Figure 5, Item 9), beneath both hydraulic and pneumatic hoses (Figure 5, Item 3 and Item 6) into opening on top of upper suspension arm (Figure 5, Item 1).
 - b. Attach bottom hook (Figure 5, Item 8) of suspension chain (Figure 5, Item 4) onto back end of square under axle (Figure 5, Item 7), outboard of parking brake chamber (Figure 5, Item 5).
20. Raise platform (WP 0008) until bogie can be turned.
21. Start to turn bogie (Figure 5, Item 9) outboard, away from center of platform.
22. Continue to rotate bogie (Figure 5, Item 9) until axle is approximately parallel with side edge of platform.



HETT0292

Figure 5. Attach Suspension Chains for Removal.

23. Position overhead lifting device (Figure 6, Item 1) over outboard edge of platform directly above upper suspension arm (Figure 6, Item 3) of bogie (Figure 6, Item 4).
24. Use two lifting straps (Figure 6, Item 2) to pass one end of each lifting strap between upper suspension arm (Figure 6, Item 3) and suspension cylinder (Figure 6, Item 5).
25. Continue to wrap lifting straps (Figure 6, Item 2) under all hoses a minimum of two times around upper suspension arm (Figure 6, Item 3). Connect both ends of each lifting strap to overhead lifting device (Figure 6, Item 1). Take up slack in lifting straps.



HETT0293

Figure 6. Bogie Removal.

NOTE

It may be necessary to use a crowbar to unseat lower bearing on bogie as overhead lifting device is lowered.

26. Use one person stationed at hydraulic control module to start to raise platform slowly (WP 0008). Second person must insert crowbar (Figure 7, Item 6) above upper suspension arm (Figure 7, Item 2) to pry upper suspension arm downward, away from spindle (Figure 7, Item 1). Use third person to lower overhead lifting device (Figure 7, Item 4) slightly to prevent upper suspension arm from rising with platform.

CAUTION

Extreme caution must be used to ensure that the upper suspension arm does not make contact with the platform spindle or damage to equipment may result.

27. Continue to pry upward on crowbar (Figure 7, Item 6) and raise platform until upper suspension arm (Figure 7, Item 2) is separated and clear of platform spindle (Figure 7, Item 1). Use isolation valve handle extension to close suspension isolation valves at four corners of platform (WP 0004).
28. Remove two hydraulic hoses (Figure 7, Item 5) from drain pan and wrap hydraulic hoses and two pneumatic hoses (Figure 7, Item 3) around upper suspension arm (Figure 7, Item 2).

WARNING



Personnel moving the bogie out from under the platform must not, at any time, use the caging bolt as a holding device. The caging bolt is held in place by pressure from a spring in the brake chamber. If the caging bolt becomes unseated from inside the brake chamber, serious injury or death to personnel may result.

29. With two people positioned at each set of dual tires on bogie (Figure 7, Item 7), and a third person guiding/operating overhead lifting device (Figure 7, Item 4), slowly roll bogie out from under platform.

CAUTION

Alternate driving points on inner race of lower suspension bearing cone or damage to equipment may result.

30. Use hammer and brass drift to drive lower bearing cone (Figure 7, Item 10) and oil seal (Figure 7, Item 9) from upper suspension arm (Figure 7, Item 2). Discard oil seal.
31. Remove suspension chain (Figure 7, Item 8) from bogie.

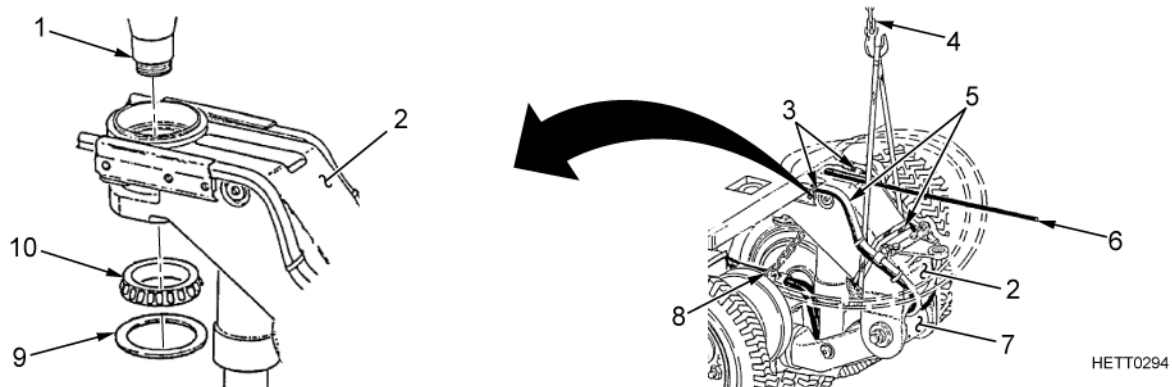


Figure 7. Prying Upper Suspension Arm from Spindle.

32. Shut down APU (WP 0005).

WARNING



SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)

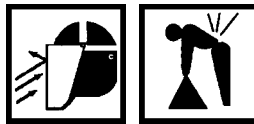
- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
 - The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
 - Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
 - Fire extinguishers should be placed nearby when using solvent cleaning compound.
 - Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
 - Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.
- Failure to follow these warnings may result in injury or death to personnel.**
33. Use wiping rags to clean all grease from inside of upper suspension arm cavity, platform spindle, and associated parts. Clean all parts using degreaser tank with cleaning solvent. Inspect upper suspension arm, platform spindle, upper and lower bearing cups, lower bearing cone, spacer, and attaching hardware for cracks, scoring, gouges, bends, and corrosion. Replace all defective parts.
 34. Inspect suspension arm upper bearing cone, still on platform spindle, for defects. If defective, notify field maintenance.
 35. Inspect threads on spindle for roughness and deformation. Use a thread file to dress threads as necessary to ensure smooth reinstallation of spanner nut.

END OF TASK

INSTALLATION

1. Use grease to lubricate handgun, and use lubricant-bearing packer to pack upper suspension bearing cone per lubrication instructions (WP 0163).
2. Follow steps 3 through 5 if lifting straps (Figure 8, Item 5) were removed from bogie (Figure 8, Item 7).
3. Position overhead lifting device (Figure 8, Item 4) above upper suspension arm (Figure 8, Item 3) of bogie (Figure 8, Item 7).
4. Pass one end of each lifting strap (Figure 8, Item 5) between upper suspension arm (Figure 8, Item 3) and suspension cylinder (Figure 8, Item 8).
5. Continue to wrap lifting straps (Figure 8, Item 5) a minimum of two times around suspension arm (Figure 8, Item 3) and connect both ends of each lifting strap to overhead lifting device (Figure 8, Item 4). Take up slack in lifting strap until upper cavity is level.
6. Remove masking tape from platform spindle (Figure 8, Item 1) and install spanner nut (Figure 8, Item 9) partially onto spindle to protect threads. Continue to thread spanner nut onto platform spindle until nut is flush with bottom of spindle. Discard masking tape.

WARNING



Personnel moving the bogie out from under the platform must not, at any time, use the caging bolt as a holding device. The caging bolt is held in place by pressure from a spring in the brake chamber. If the caging bolt becomes unseated from inside the brake chamber, injury to personnel and damage to equipment may result.

7. With two people positioned at bogie (Figure 8, Item 7), and a third person to guide overhead lifting device (Figure 8, Item 4), two people with bogie slowly roll bogie under platform and into alignment under platform spindle (Figure 8, Item 1).
8. Use crowbar (Figure 8, Item 2) to center bearing cavity in upper suspension arm (Figure 8, Item 3) within platform spindle (Figure 8, Item 1).
9. Remove caps/plugs installed on two hydraulic hoses (Figure 8, Item 6) to allow suspension cylinder (Figure 8, Item 8) to draw in air as suspension cylinder expands.

NOTE

- It may be necessary to use the crowbar to help start to raise the upper suspension arm as the overhead lifting device is raised.
 - Use the crowbar to pry the upper suspension arm upward, and use one of the dual sets of tires on the bogie to pry against.
 - A floor jack placed under the bogie may be used to assist in aligning upper suspension arm with spindle.
10. Place crowbar (Figure 8, Item 2) just behind suspension cylinder (Figure 8, Item 8) and on top of one set of dual tires on bogie (Figure 8, Item 7).

CAUTION

When raising upper suspension arm, ensure the upper suspension arm does not contact the platform spindle or damage to equipment may result.

NOTE

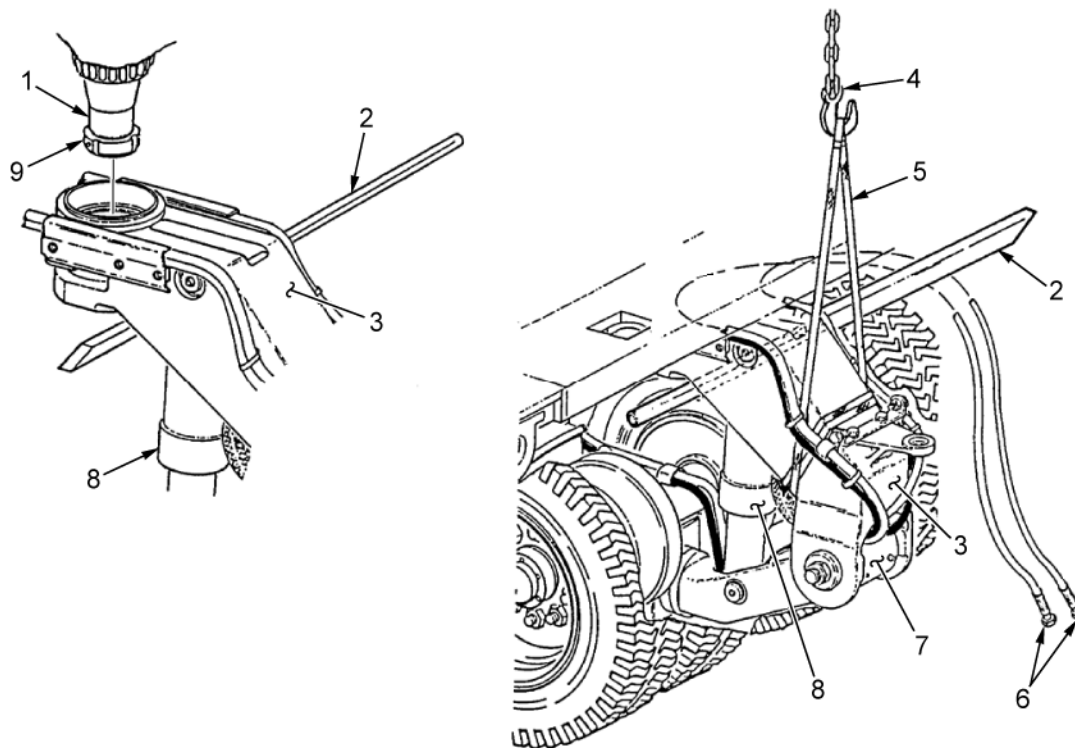
The following task requires three people: one person to operate the overhead lifting device; one person to adjust the position of the upper suspension arm with a crowbar; and one person to check and assist in alignment of the bogie's upper suspension arm with the platform spindle.

11. Using one person to carefully push down on crowbar (Figure 8, Item 2) and one person operating overhead lifting device (Figure 8, Item 4), start raising upper suspension arm (Figure 8, Item 3) onto platform spindle (Figure 8, Item 1).

CAUTION

The upper suspension arm must be raised slowly. Adjust the position of the arm as necessary to center the upper suspension arm bearing cavity under the platform spindle to ensure the platform spindle does not make contact with bearing cups, or damage to equipment may result.

12. Have two people continue to check and adjust position of upper suspension arm (Figure 8, Item 3) with crowbar (Figure 8, Item 2), while third person continues to slowly raise overhead lifting device (Figure 8, Item 4) until upper suspension arm raises onto platform spindle (Figure 8, Item 1).



HETT0295

Figure 8. Bogie Installation.

WARNING

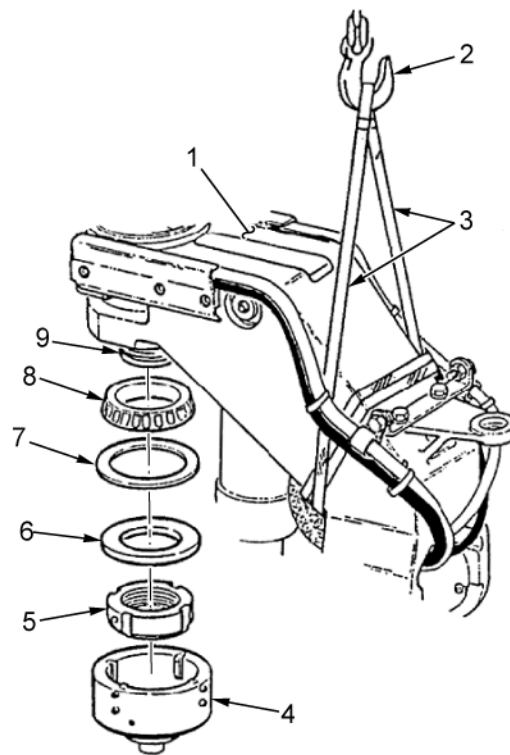
If the platform must be lowered onto the bogie to seat the upper suspension arm bearing, use caution not to apply too much force against the lifting straps and overhead lifting device. Excess force against the lifting devices used to pull/hold the upper suspension arm upward can break the straps or strain the lifting device, and injury to personnel and damage to equipment may result.

13. If necessary, carefully lower platform (WP 0008), as required, to facilitate final seating of upper bearing within upper suspension arm. Once seated, shut down APU (WP 0005).
14. Remove spanner nut (Figure 9, Item 5) from spindle (Figure 9, Item 9).
15. Align and install lower bearing cone (Figure 9, Item 8) on spindle (Figure 9, Item 9) by hand. Push up lower bearing cone as far as possible.
16. Use ratchet and spanner socket (Figure 9, Item 4) to install spanner nut (Figure 9, Item 5) onto spindle (Figure 9, Item 9). Tighten spanner nut to seat upper suspension arm (Figure 9, Item 1) onto spindle.
17. Hold lower bearing cone (Figure 9, Item 8) by hand and remove ratchet, spanner socket (Figure 9, Item 4), and spanner nut (Figure 9, Item 5).

CAUTION

Spacer must be centered; it must not be hung up on the lip of the spindle, or damage to equipment may result.

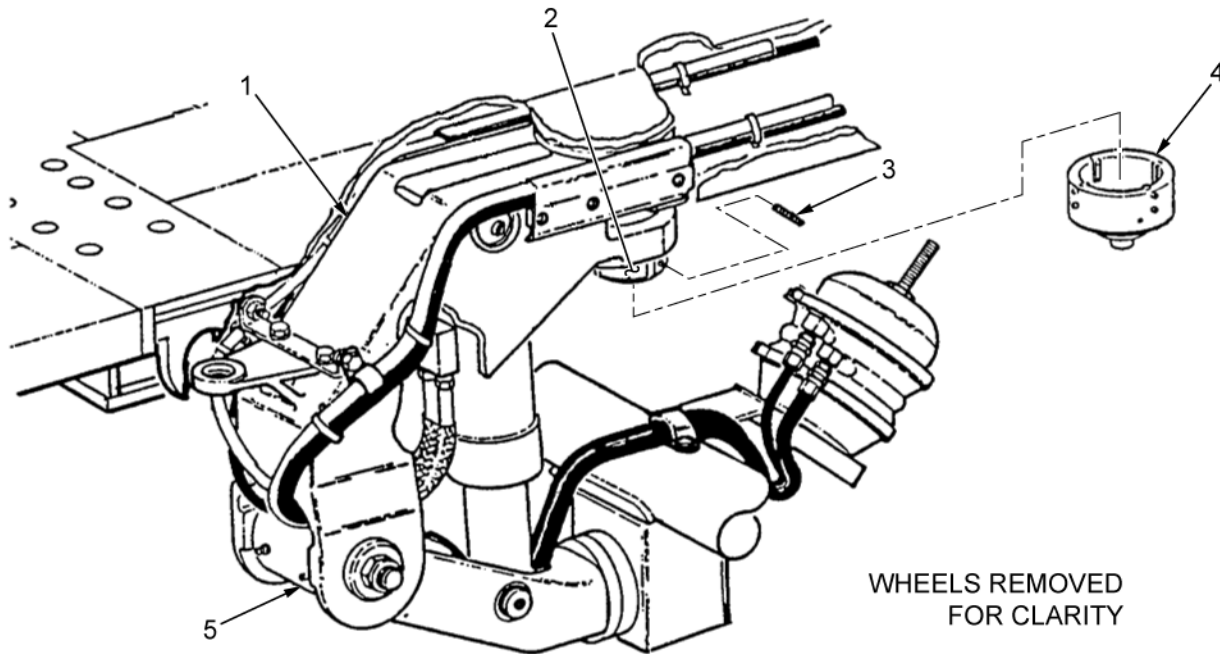
18. While holding lower bearing cone (Figure 9, Item 8) in place inside upper suspension arm (Figure 9, Item 1), install spacer (Figure 9, Item 6) and spanner nut (Figure 9, Item 5).
19. Attach ratchet and spanner socket (Figure 9, Item 4) to spanner nut (Figure 9, Item 5) and tighten spanner nut to seat lower suspension bearing cone (Figure 9, Item 8) into upper suspension arm (Figure 9, Item 1).
20. Use two people to continue to tighten spanner nut (Figure 9, Item 5) as much as possible. Remove spanner socket (Figure 9, Item 4) and ratchet.
21. Use hammer to drive oil seal (Figure 9, Item 7) into upper suspension arm (Figure 9, Item 1).
22. Lower lifting device (Figure 9, Item 2) and remove lifting straps (Figure 9, Item 3) from upper suspension arm (Figure 9, Item 1).



HETT0296

Figure 9. Spanner Nut on Spindle Installation.

23. Use two people to rotate bogie (Figure 10, Item 5) inboard to its original forward position, facing toward front of semitrailer.
24. Use two people, ratchet, torque wrench, torque multiplier, and spanner socket (Figure 10, Item 4) to torque spanner nut (Figure 10, Item 2) to 850 lb-ft \pm 50 lb-ft (1153 Nm \pm 67 Nm) into upper suspension arm (Figure 10, Item 1).
25. Remove torque wrench, torque multiplier, and spanner socket (Figure 10, Item 4) from spanner nut (Figure 10, Item 2).
26. Install setscrew (Figure 10, Item 3) into spanner nut (Figure 10, Item 2).



HETT0297

Figure 10. Bogie Installation.

27. Ensure bogie (Figure 11, Item 3) is positioned in original forward position, facing toward front of semitrailer.
28. For no. 1 bogie (Figure 11, Item 3) only, align and install preformed packing (Figure 11, Item 6) onto bogie.
29. Remove special pin (Figure 11, Item 5), nut (Figure 11, Item 4), and capscrew (Figure 11, Item 2) from connecting link (Figure 11, Item 1). Align and install connecting link onto linkage attaching point on bogie (Figure 11, Item 3). Secure in place by installing capscrew and nut.
30. Use torque wrench to torque nut (Figure 11, Item 4) to 205 lb-ft (278 Nm). Continue to tighten nut until first available slot is aligned with hole and special pin (Figure 11, Item 5) can be installed.

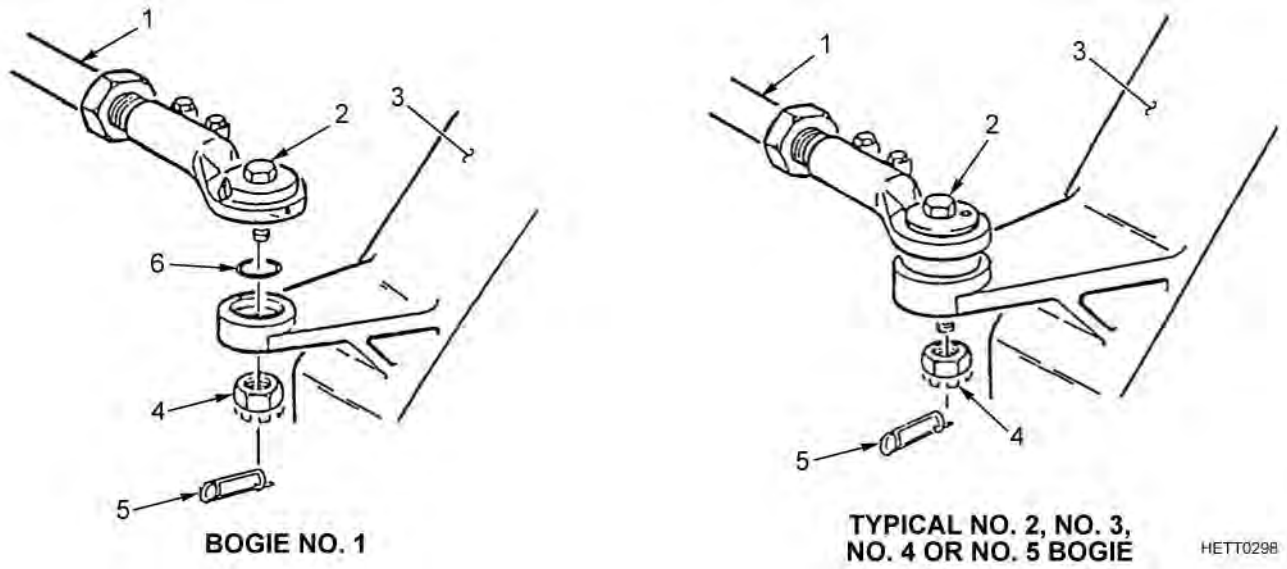
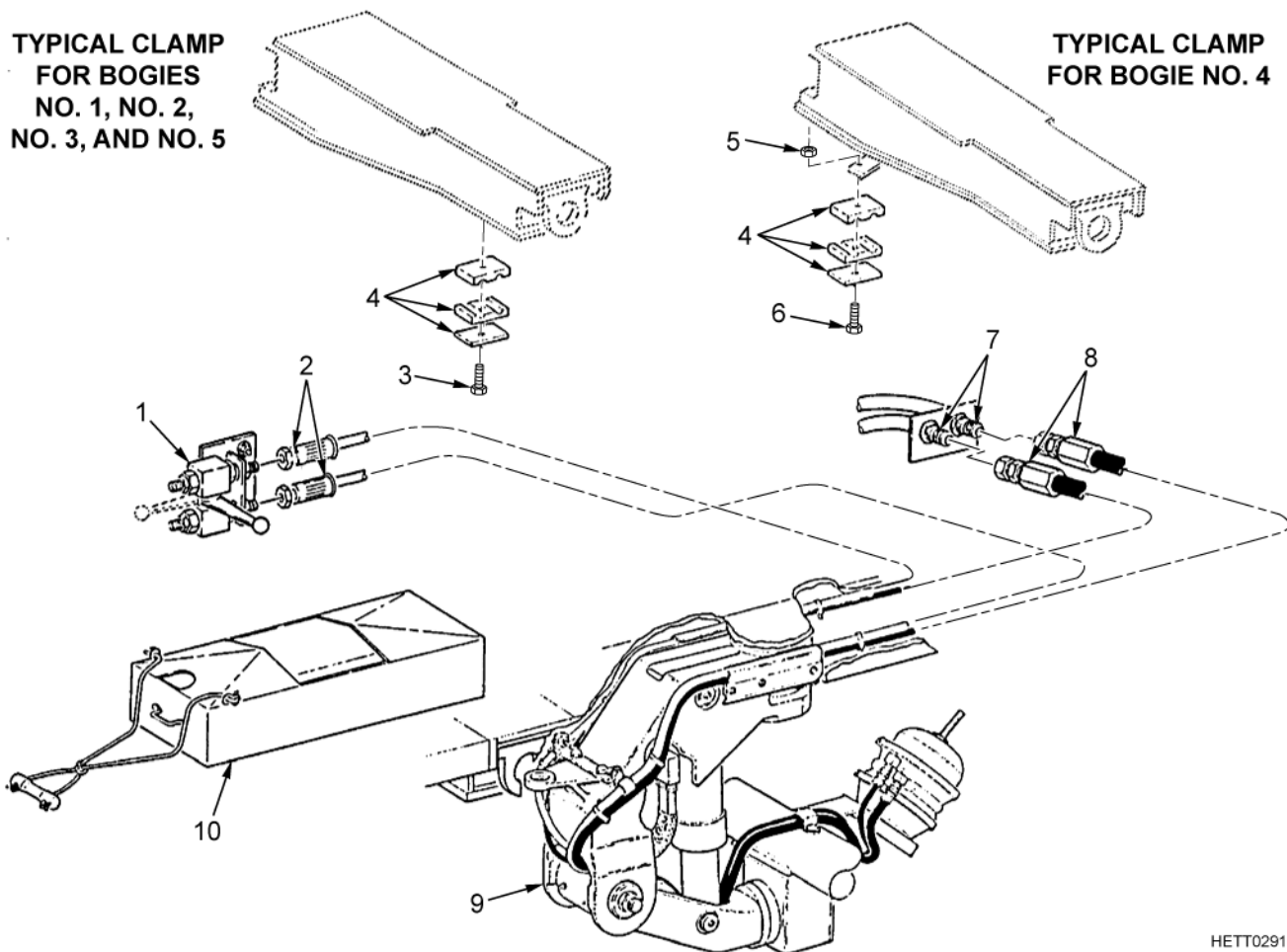


Figure 11. Bogie Installation.

31. Reconnect two hydraulic hoses (Figure 12, Item 2) to suspension isolation valve (Figure 12, Item 1).
32. Secure two hydraulic hoses (Figure 12, Item 2) with block clamps (Figure 12, Item 4) as follows:
 - a. For bogies (Figure 12, Item 9) no. 1, 2, 3, and 5, install sections of block clamp (Figure 12, Item 4) over both hydraulic hoses (Figure 12, Item 2) and secure block clamp with capscrew (Figure 12, Item 3) and locknut (Figure 12, Item 5).
 - b. For bogie no. 4, install sections of block clamps (Figure 12, Item 4) over both hydraulic hoses (Figure 12, Item 2) and secure block clamps with capscrew (Figure 12, Item 6) and locknut (Figure 12, Item 5). Torque capscrew to 70 to 80 in.-lb. (7.9 to 9.0 Nm).
33. Remove caps/plugs and oil drain pan (Figure 12, Item 10), and reconnect two pneumatic hoses (Figure 12, Item 8) to two bulkhead fittings (Figure 12, Item 7).

**TYPICAL CLAMP
FOR BOGIES
NO. 1, NO. 2,
NO. 3, AND NO. 5**

**TYPICAL CLAMP
FOR BOGIE NO. 4**



HETT0291

Figure 12. Pneumatic Hoses to Bulkhead Fittings Installation.

34. Couple tractor and semitrailer to recharge semitrailer air brake system (WP 0013). Start APU (WP 0005).
35. Use isolation valve handle extension to open suspension isolation valves (Figure 13, Item 1) at four corners of platform (WP 0004); ensure handles are pushed inward facing toward front of semitrailer.
36. Open suspension isolation valve (Figure 13, Item 1) at affected bogie (Figure 13, Item 2); ensure handle is pushed inward facing front of semitrailer (WP 0004).

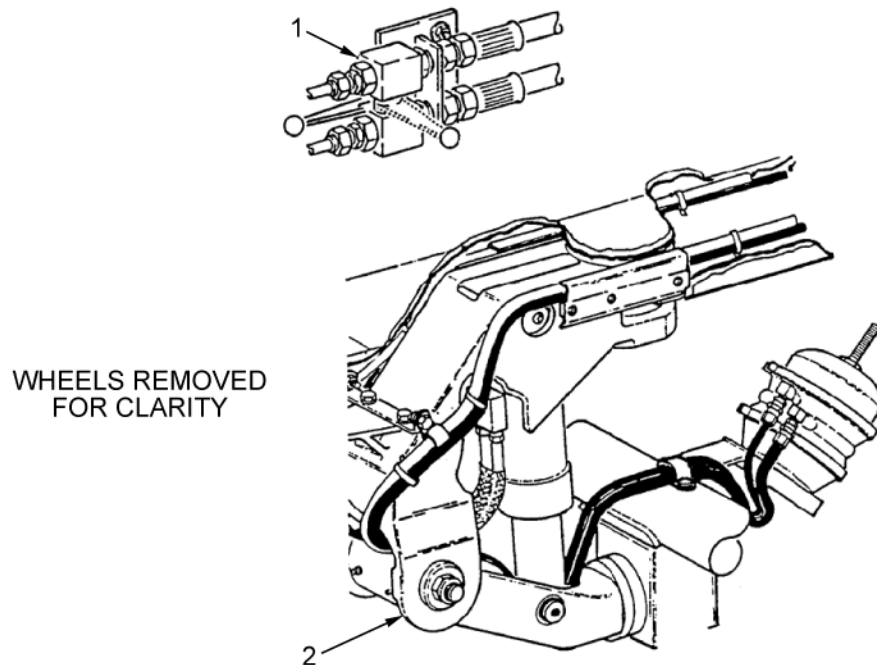


Figure 13. Affected Bogie Installation and Adjustment.

37. Continue to lower platform (WP 0008) to lowest suggested height, and then raise and lower platform several times to bleed any air trapped in suspension cylinder.
38. Adjust platform (WP 0008) to normal running height of 43 in. (109 cm).
39. Shut down APU (WP 0005).

END OF TASK

FOLLOW-ON MAINTENANCE

- Perform required lubrication to the bogie (WP 0163).
- Bleed suspension hydraulic circuit as required (WP 0041).

END OF WORK PACKAGE

FIELD MAINTENANCE**SUSPENSION CYLINDER**

INITIAL SETUP:**Tools and Special Tools**

Removal Tool (WP 0164, Item F-15)
Handle, Ext, SPNSN ISOL Valve (WP 0168, Item 1)
Mandrel, Suspension (WP 0168, Item 5)
General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)
Chain Assembly, 1/2 in. 11 ft L (WP 0168, Item 30)

Solvent, Cleaning Compound (WP 0170, Item 31)
Strap, Tiedown, Electrical (WP 0170, Item 33)
Ring Spacer Assembly (4)
Lockwasher (6)
Locknut (2)
Locknut (1)
Locknut (1)
Locknut (1)

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Crocus Cloth, Abrasive (WP 0170, Item 6)
Grease (WP 0170, Item 16)
Rag, Wiping (WP 0170, Item 23)
Sealing Compound Thread Locking (WP 0170, Item 25)

Personnel Required

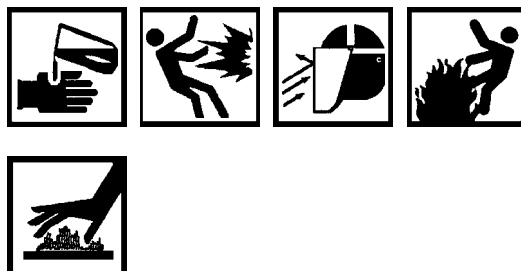
2

Equipment Conditions

Outer/inner wheel removed (WP 0079)
Inner/inner wheel removed (WP 0081)

GENERAL INFORMATION

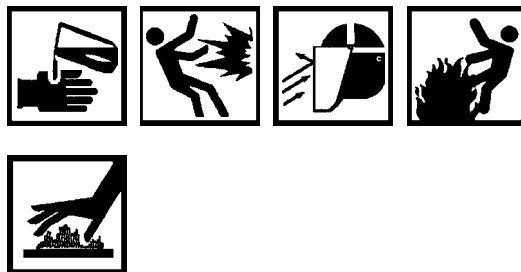
This work package contains instructions for removal, repair, and installation of the suspension cylinder.

REMOVAL**WARNING**

- Hydraulic fluid may be hot if system has been in operation. Allow time for system to cool before performing maintenance, or injury to personnel may result.
- Hydraulic fluid may be under pressure. Two wrenches must be used when disconnecting hydraulic lines or components, or injury to personnel and damage to equipment may result.
- Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into eyes, flush immediately with water and seek medical attention. If hydraulic fluid gets on skin, wash thoroughly with soap and water. Wash hands thoroughly prior to eating or smoking.

Failure to follow these warnings may result in injury or death to personnel.

1. Raise platform height to 50 in. (127 cm) (WP 0008). Shut down Auxiliary Power Unit (APU) (WP 0005).
2. Use isolation valve handle extension to close all suspension isolation valves (WP 0004).
3. Place hydraulic floor jack (Figure 1, Item 4) under lower suspension arm (Figure 1, Item 6) and operate floor jack until it makes firm contact with lower suspension arm.

WARNING

The hydraulic lines and cylinder may be under pressure. Use caution when loosening hydraulic lines to avoid any spraying of hydraulic fluid. Failure to follow this warning may result in injury or death to personnel.

CAUTION

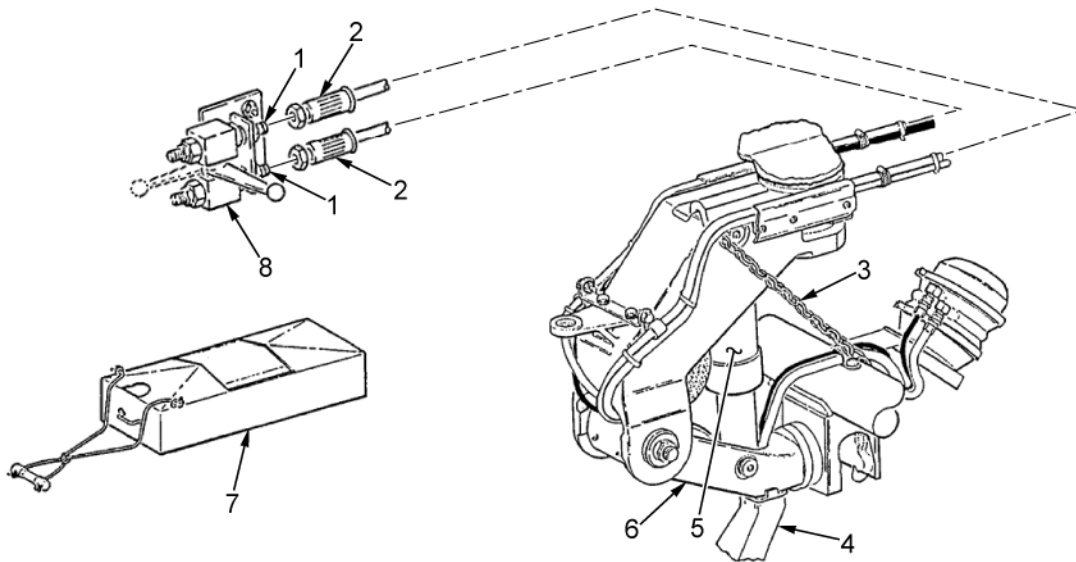
When disconnecting hydraulic lines and fittings, it is important to use two wrenches, one to hold the fitting and one to turn the hose, or damage to equipment may result.

4. Place drain pan (Figure 1, Item 7) under straight adapter fittings (Figure 1, Item 1) on suspension isolation valve (Figure 1, Item 8) and proceed as follows:
 - a. Use two wrenches to slowly loosen two hydraulic hoses (Figure 1, Item 2) enough so that pressure will bleed from suspension cylinder (Figure 1, Item 5) and hydraulic hoses.
 - b. Hold hoses in place once fluid starts to bleed and allow all pressure to vent before removing hydraulic hoses (Figure 1, Item 2) from straight adapter fittings (Figure 1, Item 1).
5. Operate hydraulic floor jack (Figure 1, Item 4) and raise lower suspension arm (Figure 1, Item 6) enough to allow suspension chain (Figure 1, Item 3) to be removed.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or foreign material from entering the hydraulic system, or damage to equipment may result.

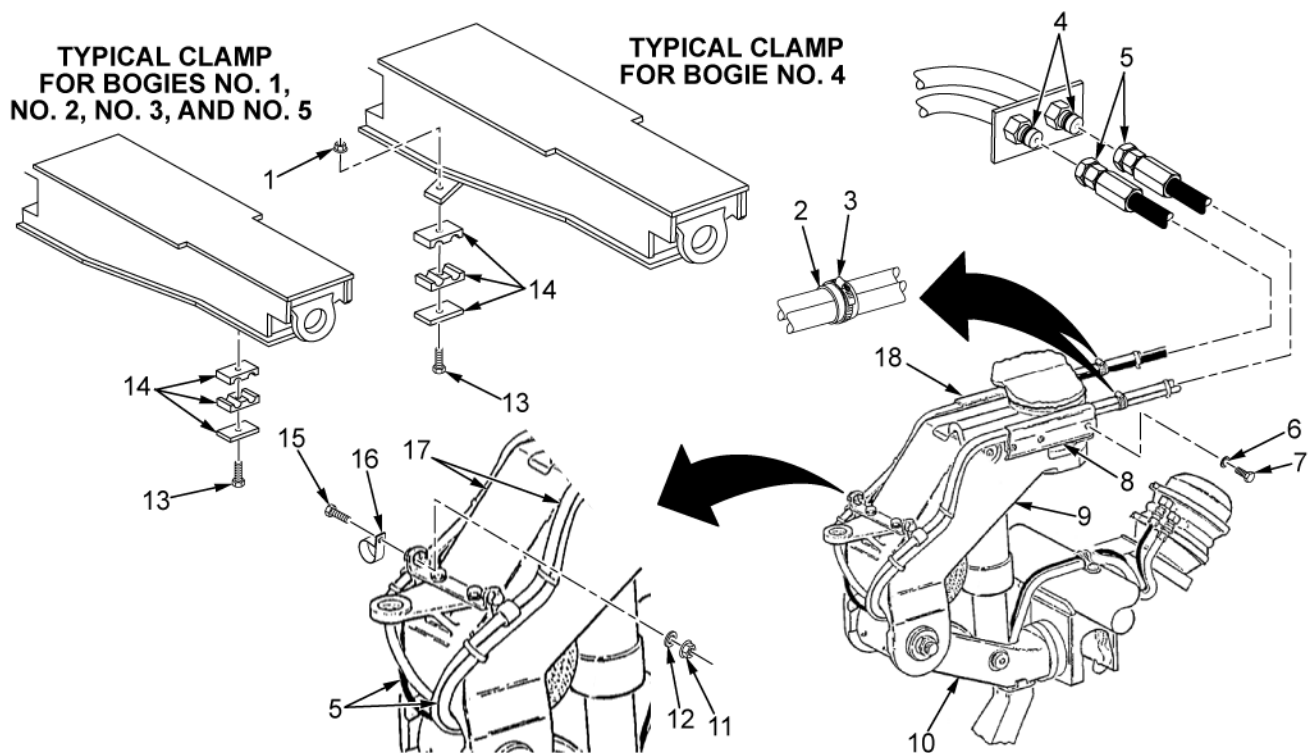
6. Tag and disconnect two hydraulic hoses (Figure 1, Item 2) from straight adapter fittings (Figure 1, Item 1) on suspension isolation valve (Figure 1, Item 8). Install caps/plugs into openings.



HETT0301

Figure 1. Hydraulic Hose Removal.

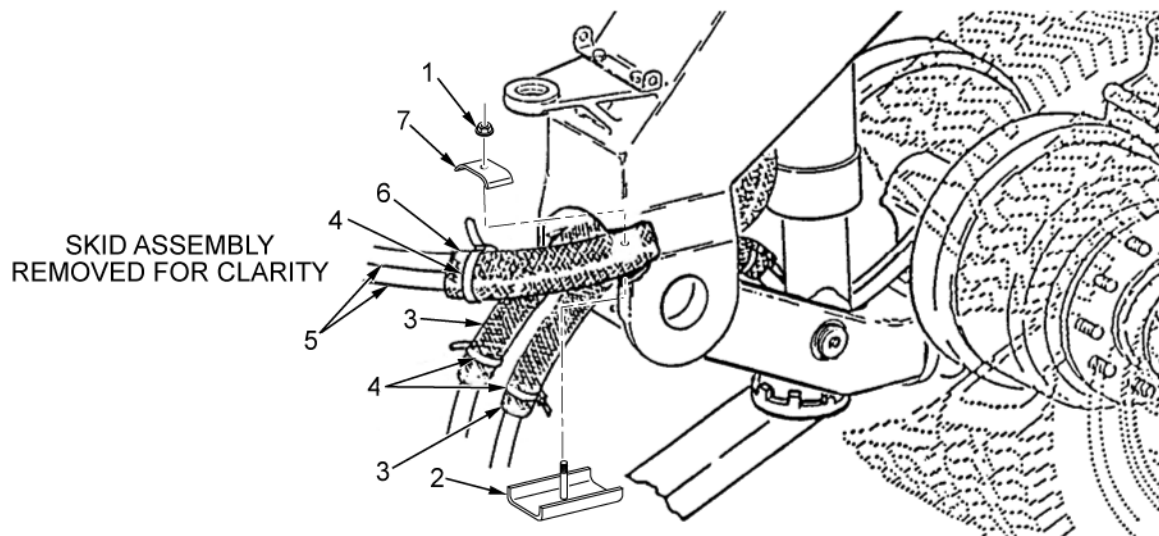
7. Remove screw (Figure 2, Item 13), block clamp (Figure 2, Item 14), and, if necessary, self-locking nut (Figure 2, Item 1) (no. 4 bogie only) from bogie. If removed, discard self-locking nut.
8. Tag and disconnect two air hoses (Figure 2, Item 5) from fittings (Figure 2, Item 4) at bulkhead. Install caps/plugs into opening/fittings.
9. Remove six capscrews (Figure 2, Item 7), lockwashers (Figure 2, Item 6), hose shield (Figure 2, Item 8), and hose shield (Figure 2, Item 18) from upper suspension arm (Figure 2, Item 9). Discard lockwashers.
10. Mark location of both hose clamps (Figure 2, Item 16) and hose clamps (Figure 2, Item 3) on hydraulic hoses (Figure 2, Item 5).
11. Remove two locknuts (Figure 2, Item 11), washers (Figure 2, Item 12), capscrews (Figure 2, Item 15), and hose clamps (Figure 2, Item 16) from upper suspension arm (Figure 2, Item 9). Discard locknuts.
12. Remove two hose clamps (Figure 2, Item 3) and protective molding (Figure 2, Item 2) from two hydraulic hoses (Figure 2, Item 17) and air hoses (Figure 2, Item 5).
13. Lay both sets of hydraulic hoses (Figure 2, Item 17) and air hoses (Figure 2, Item 5) in a straight line forward of lower suspension arm (Figure 2, Item 10).



HETT0302

Figure 2. Upper Suspension Arm Removal.

14. Mark locations of all electrical tiedown straps (Figure 3, Item 4), and mark starting and ending points for each protective loom (Figure 3, Item 6 and Item 3) on each hose with chalk. Cut and remove all accessible electrical tiedown straps.
15. Remove locknut (Figure 3, Item 1) and loop clamp (Figure 3, Item 7) from skid assembly (Figure 3, Item 2). Remove two hydraulic hoses (Figure 3, Item 5) from skid assembly. Discard locknut.



HETT0303

Figure 3. Electrical Tiedown Strap Locations.

16. Use external retaining ring pliers to remove two retaining rings (Figure 4, Item 2) from upper pin (Figure 4, Item 3). Remove lubrication fitting (Figure 4, Item 1) from upper pin.
17. Use sledge hammer and removal tool to drive upper pin (Figure 4, Item 3) out of upper suspension arm (Figure 4, Item 12) and suspension cylinder (Figure 4, Item 6).

NOTE

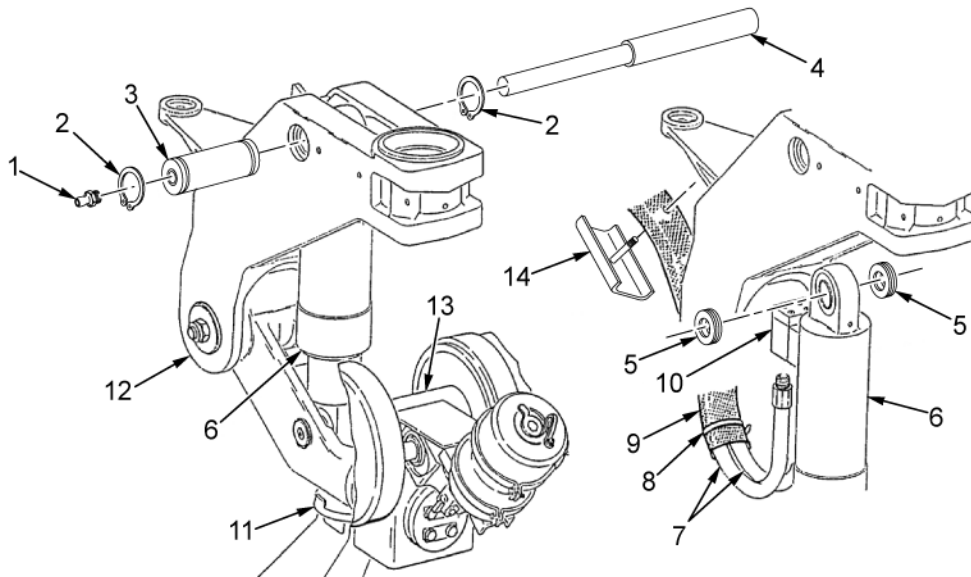
As the suspension cylinder is lowered out of the upper suspension arm, ring spacer assemblies will probably fall to the ground.

18. Once upper pin (Figure 4, Item 3) has been removed with removal tool (Figure 4, Item 4), lower hydraulic floor jack (Figure 4, Item 11), compress suspension cylinder (Figure 4, Item 6) fully, and then pull on suspension cylinder so that cylinder rests back against axle (Figure 4, Item 13).
19. If the two ring spacer assemblies (Figure 4, Item 5) fall when moving suspension cylinder (Figure 4, Item 6), pick up and discard ring spacer assemblies.
20. Cut and remove electrical tiedown straps (Figure 4, Item 8) from loom (Figure 4, Item 9). Remove skid assembly (Figure 4, Item 14) from loom.

CAUTION

The ends of each hydraulic hose connected to the suspension cylinder line fracture valve do not have swivel fittings. During removal, each entire hose must be turned counterclockwise at the same rate as the end fitting is turned or damage to equipment may result.

21. Use one person to loosen each hose and one person to turn each hose (Figure 4, Item 7) counterclockwise. Tag and disconnect two hydraulic hoses from line fracture valve (Figure 4, Item 10).
22. Remove two hydraulic hoses (Figure 4, Item 7) from bogie. Measure and document hole in loom (Figure 4, Item 9) for skid assembly. Remove loom from both hydraulic hoses.



HETT0304

Figure 4. Upper Pin Removal.

23. Use external retaining ring pliers to remove two retaining rings (Figure 5, Item 11) from lower pin (Figure 5, Item 9). Remove lubrication fitting (Figure 5, Item 10) from lower pin.

CAUTION

Do not use excessive force when attempting to remove lower pin or damage to equipment may result. If lower pin cannot be removed after several attempts, notify field maintenance.

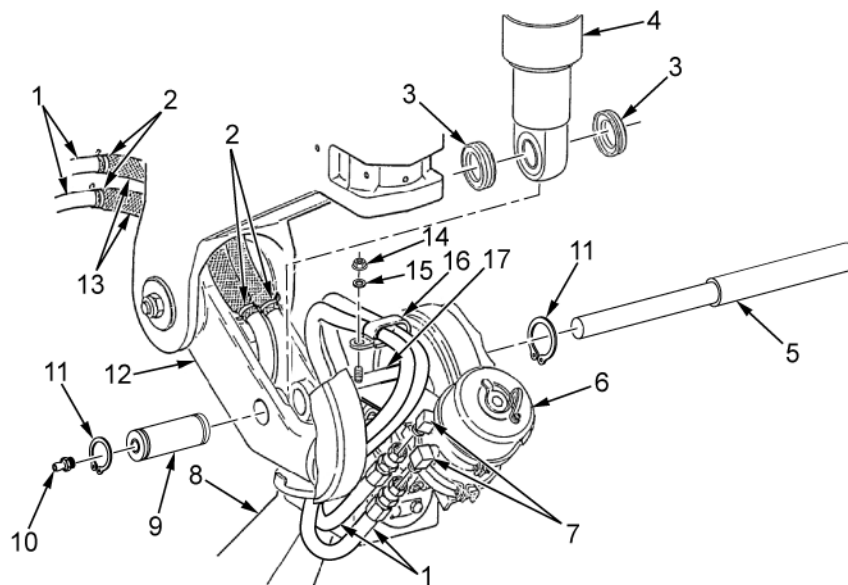
24. Use sledge hammer and removal tool (Figure 5, Item 5), using moderate driving force, to drive lower pin (Figure 5, Item 9) out of lower suspension arm (Figure 5, Item 12) and suspension cylinder (Figure 5, Item 4). If lower pin cannot be removed after several attempts, perform procedures in WP 0150 to remove pin.

WARNING



The suspension cylinder weighs approximately 85 lb (39 kg) empty. Two people are required to lift suspension cylinder out of the lower suspension arm, or injury to personnel may result.

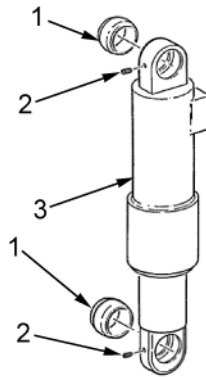
25. If necessary, lower hydraulic floor jack (Figure 5, Item 8), and using two people, remove suspension cylinder (Figure 5, Item 4) from lower suspension arm (Figure 5, Item 12).
26. Remove and discard two ring spacer assemblies (Figure 5, Item 3) from suspension cylinder (Figure 5, Item 4) or lower suspension arm (Figure 5, Item 12).
27. Mark location of hose clamp (Figure 5, Item 16) on two air hoses (Figure 5, Item 1). Remove locknut (Figure 5, Item 14), washer (Figure 5, Item 15), and hose clamp from axle (Figure 5, Item 17). Discard locknut.
28. Tag and disconnect two air hoses (Figure 5, Item 1) from elbow fittings (Figure 5, Item 7) on brake chamber (Figure 5, Item 6).
29. Remove two air hoses (Figure 5, Item 1) from lower suspension arm (Figure 5, Item 12). Install caps/plugs into openings/fittings. Cut and remove electrical tiedown straps (Figure 5, Item 2) from loom (Figure 5, Item 13), if necessary, and remove loom from each air hose.



HETT0305

Figure 5. Removal of Two Retaining Rings.

30. Remove two setscrews (Figure 6, Item 2) and bushings (Figure 6, Item 1) from suspension cylinder (Figure 6, Item 3).



HETT0818

Figure 6. Removal of Setscrews and Bushings.

END OF TASK

REPAIR

WARNING



SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
- The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound.
- Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury. Failure to follow these warnings may result in injury or death to personnel.

1. Use degreaser tank with cleaning compound solvent to clean suspension cylinder, upper and lower suspension arms, upper and lower pins, and attaching hardware. Crocus cloth may be used to remove any excess buildup on upper or lower pins.
2. Use a 1/8 in. (0.3 cm) wire to work dirt out of lubrication fitting and grease holes in center and at end of lower pin.
3. Clean bore of bearings in cylinder with a crocus cloth and solvent. Use welding tip cleaner set to clean out two grease holes and grease groove in bore of bearing.
4. After bearings and pin have been cleaned, install lubrication fitting into lower pin and install lower pin into lower cylinder bearing. Use lubricating handgun to apply grease to lubrication fitting. If grease does not come out between spherical bearing and outer shell of bearing, more cleaning is necessary.
5. Inspect hoses (Figure 7 and Figure 8) for defects, kinks, chafing, and deterioration. If one or more hydraulic and/or air hoses need to be replaced, proceed with next four steps.
6. Place defective hose(s) on a workbench so that each hose is flat and straight.
7. Obtain replacement hydraulic hose(s) or fabricate replacement air hose(s) (WP 0074 or WP 0124).
8. Lay replacement hose(s) next to defective hose(s).
9. Transfer all chalk marks made on defective hose(s) to same locations on replacement hose(s) or mark new hoses as indicated on illustration.

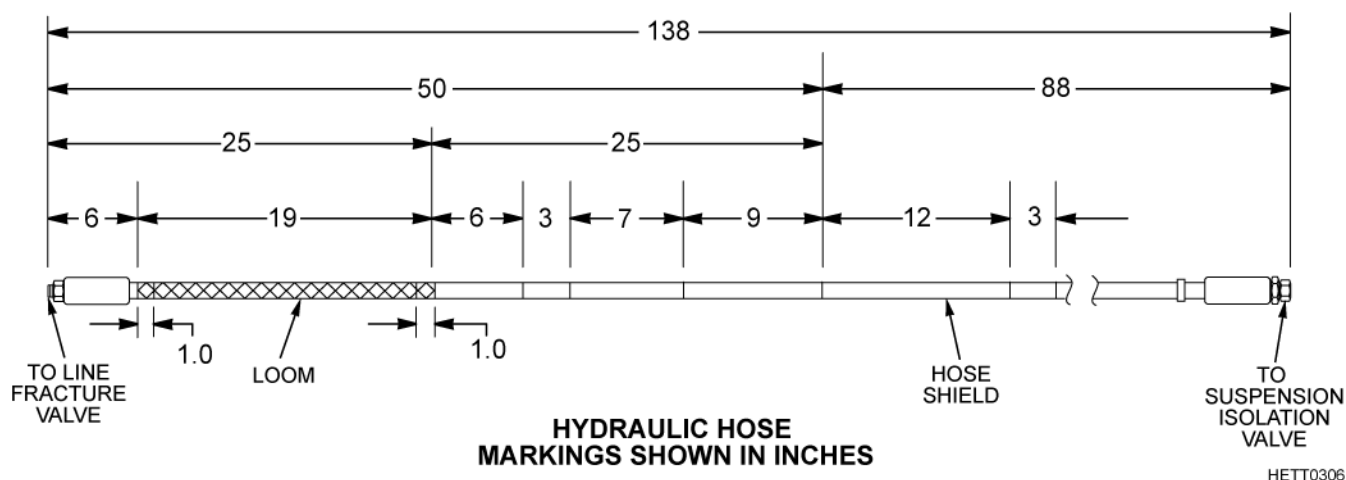


Figure 7. Inspecting Hydraulic Hoses for Defects.

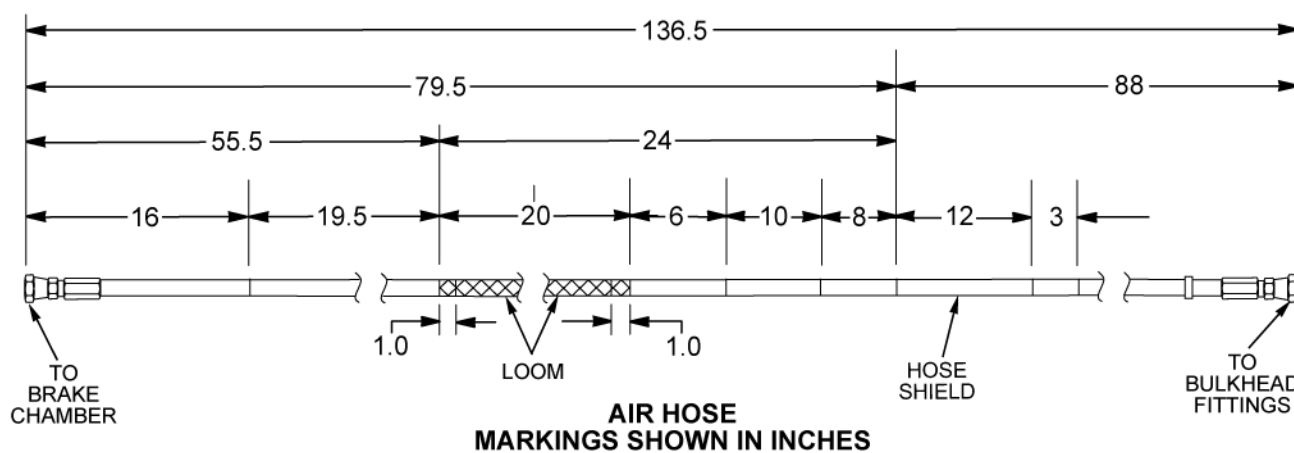


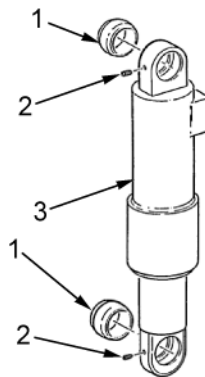
Figure 8. Inspecting Air Hoses for Defects.

WARNING

- Adhesives, solvents, and sealing compounds may burn easily, may give off harmful vapors, and are harmful to skin and clothing. Keep away from open flames and use in well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.
- On direct contact, uncured silicone sealant irritates eyes. In case of contact, flush eyes with water and seek medical attention. In case of skin contact, wipe off and flush with water.

Failure to follow these warnings may result in injury or death to personnel.

10. Apply locking compound to two setscrews (Figure 9, Item 2) and two bushings (Figure 9, Item 1). Install setscrews and bushings in suspension cylinder (Figure 9, Item 3).



HETT0818

Figure 9. Installation of Setscrews and Bushings.

END OF TASK

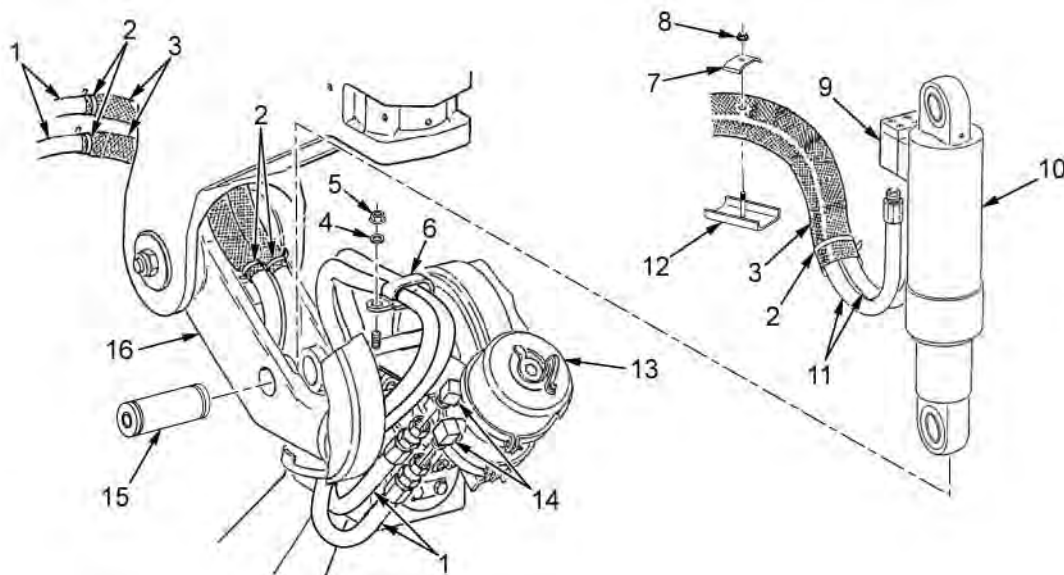
INSTALLATION

1. Install two looms (Figure 10, Item 3) on air hoses (Figure 10, Item 1) at positions previously marked.
2. Secure each loom (Figure 10, Item 3) in place on each air hose (Figure 10, Item 1) by installing one electrical tiedown strap (Figure 10, Item 2) onto each end of loom approximately 1 in. (2.5 cm) from each end of loom.
3. Route air hoses (Figure 10, Item 1) through knee joint for lower suspension arm (Figure 10, Item 16) and under inner casting mounts for lower cylinder pin (Figure 10, Item 15).
4. Remove caps/plugs installed and connect two air hoses (Figure 10, Item 1) to elbow fittings (Figure 10, Item 14) on brake chamber (Figure 10, Item 13).
5. Install hose clamp (Figure 10, Item 6) over both air hoses (Figure 10, Item 1) at position previously marked. Secure clamp in place with washer (Figure 10, Item 4) and locknut (Figure 10, Item 5).

CAUTION

The ends of each hydraulic hose connected to the suspension cylinder line fracture valve do not have swivel fittings. During installation, each hose must be turned clockwise at the same rate as the end fitting is turned or damage to equipment may result.

6. Position suspension hydraulic cylinder (Figure 10, Item 10) on ground near lower suspension arm (Figure 10, Item 16).
7. Remove caps/plugs installed and use one person to tighten each hydraulic hose (Figure 10, Item 11) using two wrenches, and one person to turn each hose clockwise to connect two hydraulic hoses (Figure 10, Item 11) to fittings on suspension cylinder line fracture valve (Figure 10, Item 9).
8. Install loom (Figure 10, Item 3) on both hydraulic hoses (Figure 10, Item 11) at position previously marked. Secure loom in place by installing one electrical tiedown strap (Figure 10, Item 2) onto each end of loom approximately 1 in. (2.5 cm) from each end of loom.
9. Install skid assembly (Figure 10, Item 12) at position previously identified and secure with loop clamp (Figure 10, Item 7) and locknut (Figure 10, Item 8).



HETT0307

Figure 10. Loom Installation.

CAUTION

Each ring spacer is made up of two pieces. Ensure both pieces remain together or equipment damage may result. Use suspension mandrel to hold ring spacer assemblies in place. Ensure ring spacer assemblies are tightly compressed on tool or there will not be enough clearance for installation.

10. Insert suspension mandrel (Figure 11, Item 3) through lower bushing sleeve (Figure 11, Item 4) on suspension cylinder (Figure 11, Item 2). Install two ring spacer assemblies (Figure 11, Item 1) onto lower bushing sleeve of cylinder.

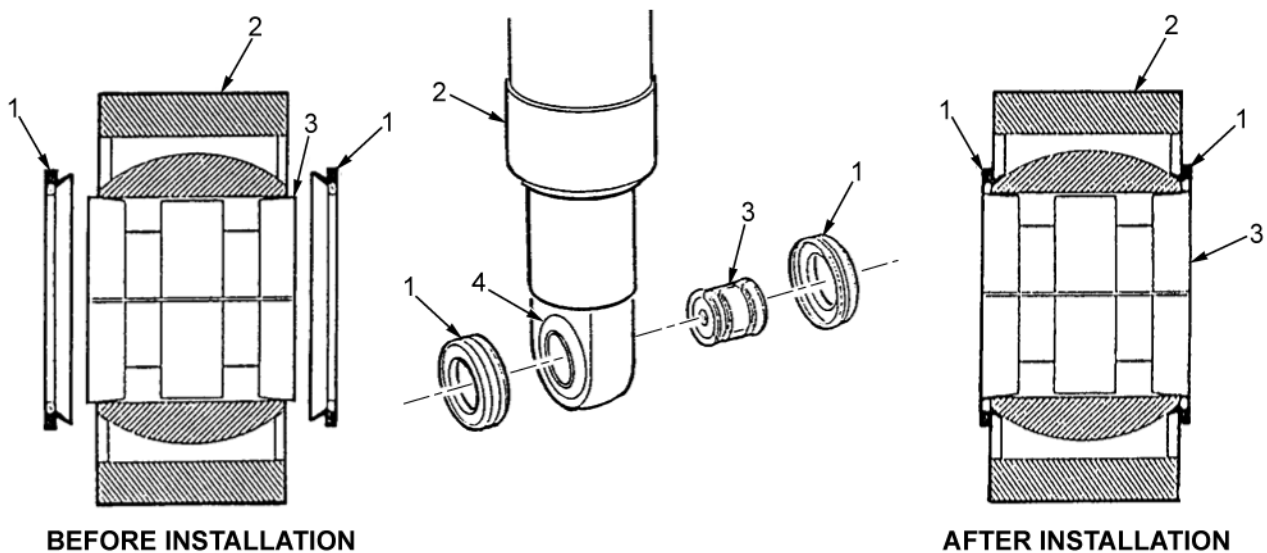
CAUTION

When compressing ring spacer assemblies onto spherical bearings, ensure the tapered part of the seal fits the spherical bearing and the ring spacer is compressed against the bearing, or damage to the ring spacer assemblies may result.

NOTE

Two people are required for this step.

11. Using two people, one person must carefully compress two ring spacer assemblies (Figure 11, Item 1) onto lower bushing sleeve (Figure 11, Item 4) of suspension cylinder (Figure 11, Item 2) while a second person tightens suspension mandrel (Figure 11, Item 3) to hold both spacers in place on lower bearing.



HETT0308

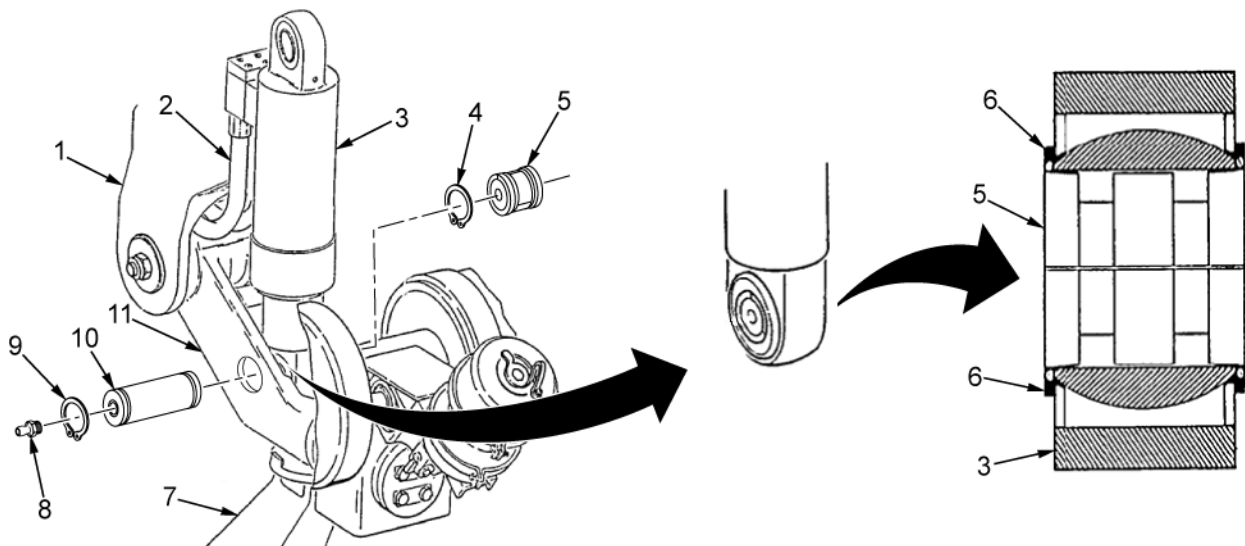
Figure 11. Before and After Suspension Mandrels and Ring Spacers (Lower) Insertion.

CAUTION

- When installing suspension cylinder into lower suspension arm casting, ensure ring spacer assemblies do not work loose or become misaligned. If spacers are misaligned or work loose, stop installation and remove cylinder, or damage to ring spacer assemblies may result. It may take a few attempts to accomplish proper ring spacer installation.
- When installing suspension cylinder into lower suspension arm, ensure the cylinder does not contact, pinch, or chafe any hydraulic or pneumatic hoses, or damage to equipment may result.

NOTE

- During installation of the cylinder, one person should observe the position of the cylinder by looking through the hole in the sides of the lower suspension arm for the lower pin.
 - During installation, the suspension cylinder can rest against the lower suspension arm to help support the cylinder.
12. Use two people with hydraulic jack (Figure 12, Item 7) to maneuver suspension cylinder (Figure 12, Item 3) into alignment with lower suspension arm (Figure 12, Item 11). Carefully lower cylinder into lower suspension arm. Check condition of ring spacer assemblies (Figure 12, Item 6) during entire installation.
 13. While checking position of ring spacer assemblies (Figure 12, Item 6) and suspension cylinder (Figure 12, Item 3), make any required adjustments to align first ring spacer assembly with hole in lower suspension arm (Figure 12, Item 11). Loosen suspension mandrel (Figure 12, Item 5).
 14. Apply grease to lower pin (Figure 12, Item 10).
 15. With ring spacer assemblies (Figure 12, Item 6) aligned, install lower pin (Figure 12, Item 10) into lower suspension arm (Figure 12, Item 11). Use soft-faced hammer to slowly drive lower pin through lower suspension arm and suspension cylinder (Figure 12, Item 3), driving suspension mandrel (Figure 12, Item 5) out of cylinder.
 16. Continue to drive lower pin (Figure 12, Item 10) through suspension cylinder (Figure 12, Item 3) and lower suspension arm (Figure 12, Item 11). Stop driving lower pin when lower pin is properly positioned (centered in lower suspension arm).
 17. Use external retaining ring pliers to install two retaining rings (Figure 12, Item 4 and Item 9) onto lower pin (Figure 12, Item 10).
 18. Install lubrication fitting (Figure 12, Item 8) onto lower pin (Figure 12, Item 10).
 19. Route two hydraulic hoses (Figure 12, Item 2) through knee joint of upper and lower suspension arms (Figure 12, Item 1 and Item 11).



HETT0309

Figure 12. Routing Hydraulic Hoses.

CAUTION

Each ring spacer is made up of two pieces. Ensure both pieces remain together or damage to equipment may result. Use suspension mandrel to hold ring spacer assemblies in place. Ensure ring spacers are tightly compressed on tool or there will not be enough clearance for installation.

20. Insert suspension mandrel (Figure 13, Item 3) through upper bushing sleeve (Figure 13, Item 2) on suspension cylinder (Figure 13, Item 4). Install two ring spacer assemblies (Figure 13, Item 1) onto upper bearing on suspension cylinder.

CAUTION

When compressing ring spacer assemblies onto bushing sleeves, ensure the tapered part of the seal properly fits the bushing sleeve and the ring spacer is compressed against the bushing, or damage to the ring spacer assemblies may result.

21. Using two people, one person must carefully compress two ring spacer assemblies (Figure 13, Item 1) onto upper bushing sleeve (Figure 13, Item 2) while a second person tightens suspension mandrel (Figure 13, Item 3) to hold both ring spacer assemblies in place on upper bushing.

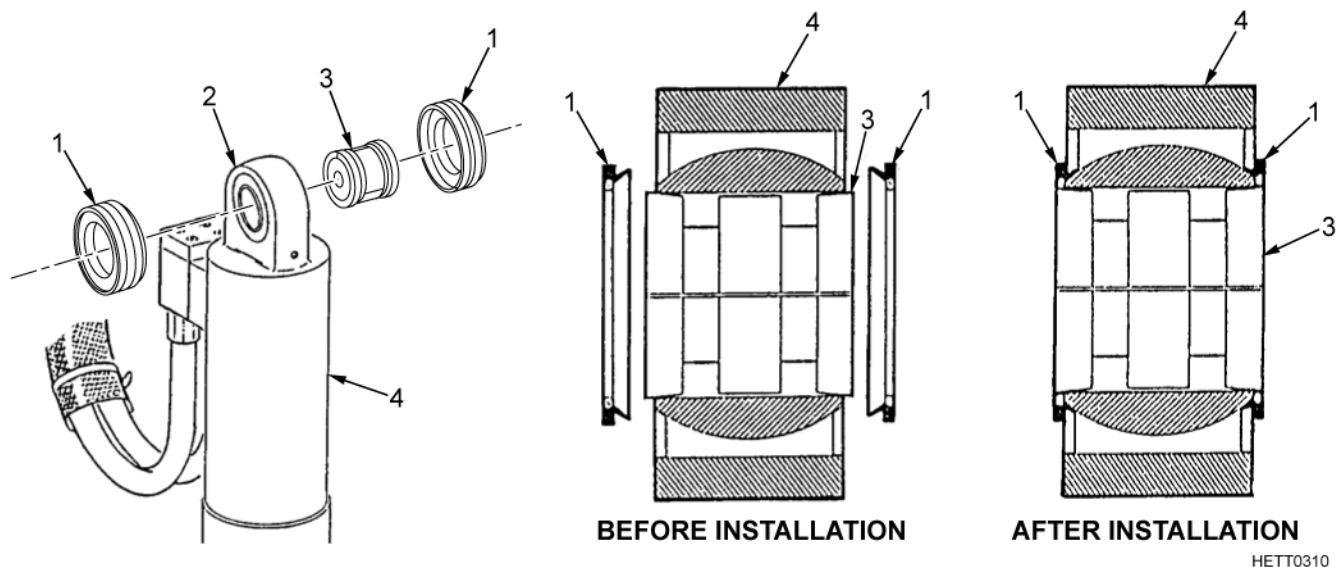


Figure 13. Suspension Mandrels and Ring Spacers (Upper) Insertion.

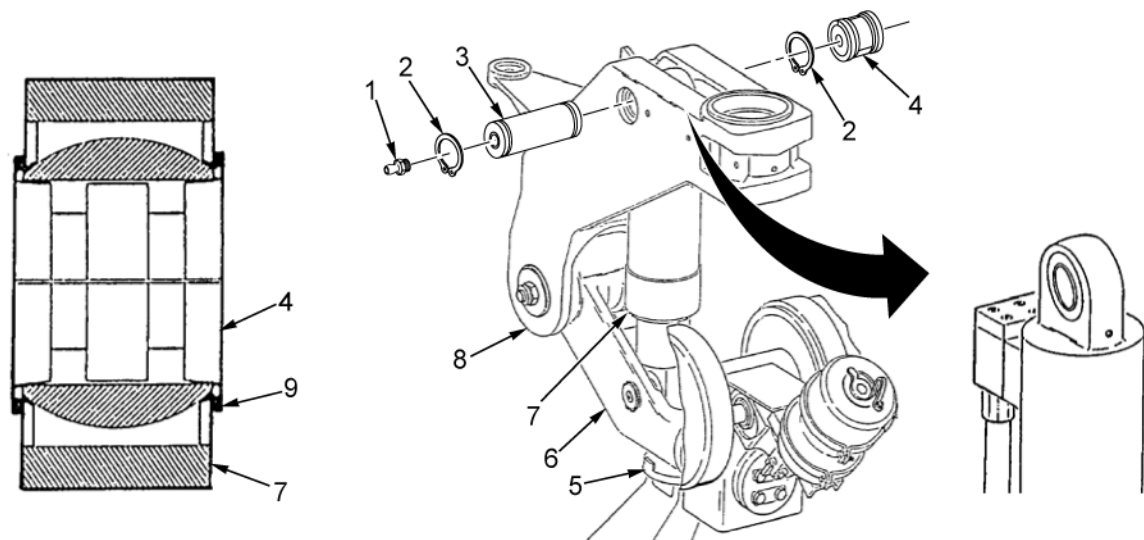
CAUTION

When installing suspension cylinder into upper suspension arm casting, ensure ring spacer assemblies do not work loose or become misaligned. If spacers are misaligned or work loose, stop installation and lower cylinder out of upper suspension arm, or damage to ring spacer assemblies may result. It may take a few attempts to accomplish proper ring spacer installation.

NOTE

During installation of the cylinder, one person should observe the position of the cylinder by looking through the hole in the sides of the upper suspension arm for the upper pin.

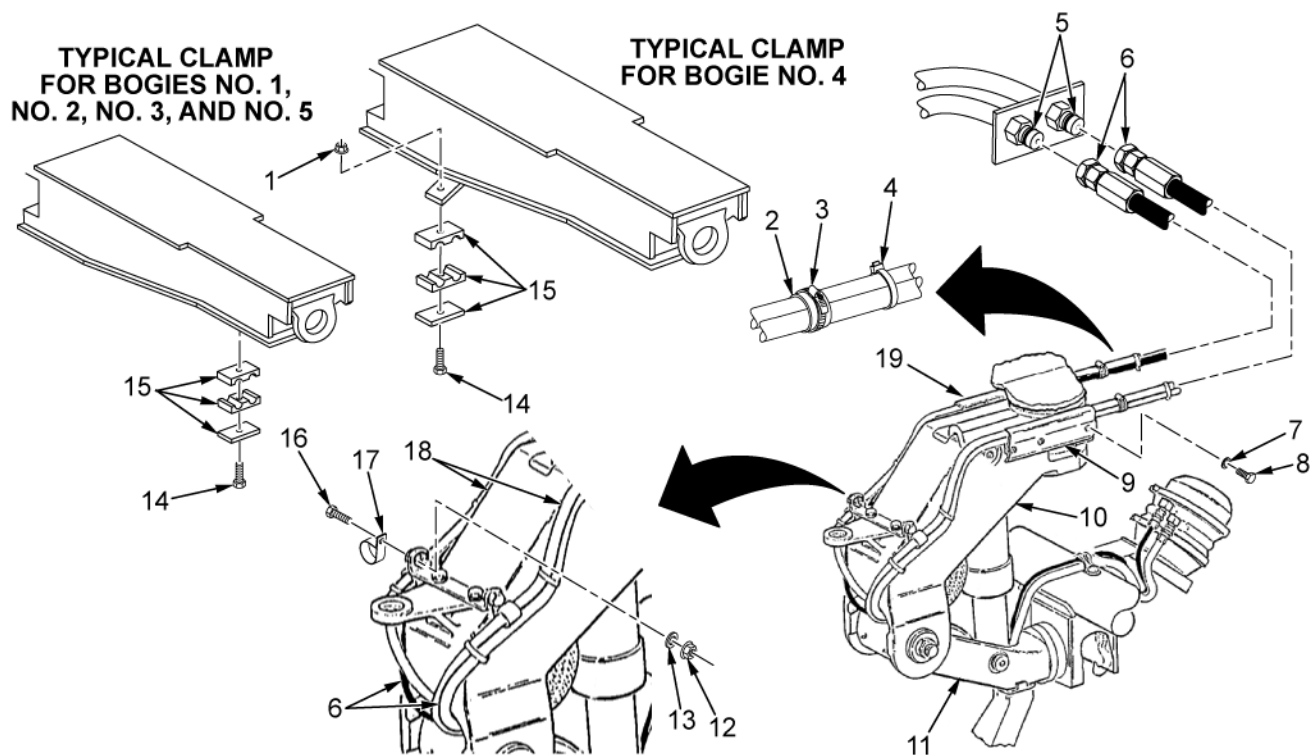
22. Use two people to maneuver suspension cylinder (Figure 14, Item 7) into alignment with upper and lower suspension arms (Figure 14, Item 6 and Item 8).
23. Use hydraulic floor jack (Figure 14, Item 5) to carefully raise cylinder (Figure 14, Item 7) into upper suspension arm (Figure 14, Item 8). Check condition of ring spacer assemblies (Figure 14, Item 9) during entire installation.
24. While checking position of ring spacer assemblies (Figure 14, Item 9) and suspension cylinder (Figure 14, Item 7), make any required adjustments to align first ring spacer assembly with hole in upper suspension arm (Figure 14, Item 8). Loosen suspension mandrel (Figure 14, Item 4).
25. Apply grease to upper pin (Figure 14, Item 3).
26. With ring spacer assemblies (Figure 14, Item 9) aligned, install upper pin (Figure 14, Item 3) into upper suspension arm (Figure 14, Item 8).
27. Use soft-faced hammer to slowly drive upper pin (Figure 14, Item 3) through upper suspension arm (Figure 14, Item 8) and suspension cylinder (Figure 14, Item 7), driving suspension mandrel (Figure 14, Item 4) out of cylinder.
28. Continue to drive upper pin (Figure 14, Item 3) through suspension cylinder (Figure 14, Item 7) and upper suspension arm (Figure 14, Item 8).
29. Stop driving upper pin (Figure 14, Item 3) when upper pin is properly positioned (centered in upper suspension arm).
30. Use external retaining ring pliers to install two retaining rings (Figure 14, Item 2) onto upper pin (Figure 14, Item 3).
31. Install lubrication fitting (Figure 14, Item 1) onto upper pin (Figure 14, Item 3).



HETT0311

Figure 14. Upper Pin Installation.

32. Install block clamp (Figure 15, Item 15) on affected bogie and secure with screw (Figure 15, Item 14) and, if necessary, self-locking nut (Figure 15, Item 1) (no. 4 bogie only).
33. Remove caps/plugs installed and connect two air hoses (Figure 15, Item 6) to fittings (Figure 15, Item 5).
34. Use one person to hold both hydraulic hoses (Figure 15, Item 18) in place and one person to install two hose clamps (Figure 15, Item 17) on hydraulic hoses at positions previously marked. Secure hose clamps in place by installing two capscrews (Figure 15, Item 16), washers (Figure 15, Item 13), and locknuts (Figure 15, Item 12).
35. Route both hydraulic hoses (Figure 15, Item 18) and air hoses (Figure 15, Item 6) along each respective side of upper and lower suspension arms (Figure 15, Item 10 and Item 11) and place each set of hoses into hose shields (Figure 15, Item 19 and Item 9).
36. Check position of shields (Figure 15, Item 19 and Item 9) on each set of hoses. Move each hose (Figure 15, Item 18) and/or (Figure 15, Item 6) as required so that marks previously applied are aligned with edges of both shields.
37. Install two shields (Figure 15, Item 19 and Item 9), with hoses attached, to upper suspension arm (Figure 15, Item 10). Secure each shield with three lockwashers (Figure 15, Item 7) and capscrews (Figure 15, Item 8).
38. Install electrical tiedown straps (Figure 15, Item 4) on hydraulic hoses (Figure 15, Item 18) and air hoses (Figure 15, Item 6) at all remaining positions previously marked as required.
39. Install protective moldings (Figure 15, Item 2) and hose clamps (Figure 15, Item 3) onto hydraulic hoses and air hoses (Figure 15, Item 18 and Item 6) at positions previously marked.



HETT0312

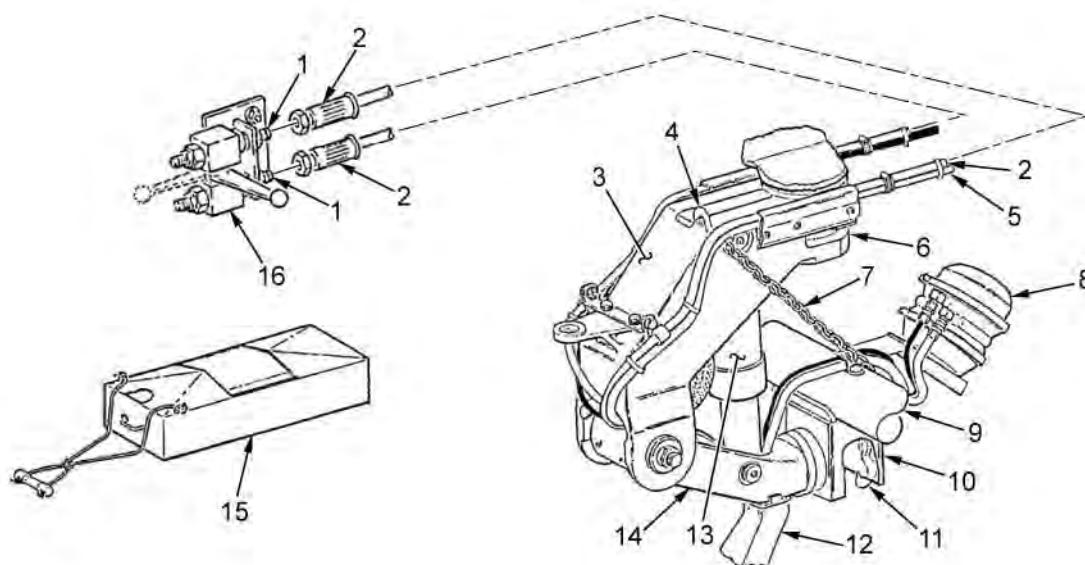
Figure 15. Check Position of Shields on Hoses.

40. Position hydraulic floor jack (Figure 16, Item 12) at suspension cylinder (Figure 16, Item 13). Use hydraulic floor jack to raise or lower the lower suspension arm (Figure 16, Item 14) to height needed to install suspension chain (Figure 16, Item 7).
41. Remove caps/plugs installed and connect two hydraulic hoses (Figure 16, Item 2) to straight adapter fittings (Figure 16, Item 1) on suspension isolation valve (Figure 16, Item 16). Remove drain pan (Figure 16, Item 15) and discard fluids per regulations.

CAUTION

When securing hook to axle, ensure the suspension chain does not contact any hydraulic hoses or air hoses. If contact is made, chafing or parting of the hoses, loss of air brake pressure, loss of hydraulic fluid, or damage to equipment may result.

42. Install suspension chain (Figure 16, Item 7) as follows:
 - a. Attach end (top) hook (Figure 16, Item 4) of suspension chain (Figure 16, Item 7) along outboard side of bogie (Figure 16, Item 3) between both hydraulic hoses (Figure 16, Item 2) and air brake hoses (Figure 16, Item 5) and upper suspension arm (Figure 16, Item 6) into opening in upper suspension arm.
 - b. Attach bottom hook (Figure 16, Item 11) of suspension chain (Figure 16, Item 7) onto back end of square casting (Figure 16, Item 10) under axle outboard (Figure 16, Item 9) of parking brake chamber (Figure 16, Item 8) on axle.
43. Lower floor jack (Figure 16, Item 12) and move floor jack clear of work area.



HETT0313

Figure 16. Raise/Lower Lower Suspension Arm.

END OF TASK

FOLLOW-ON MAINTENANCE

- Align and install inner/outer wheel (WP 0080).
- Align and install outer/outer wheel (WP 0078).
- Perform required lubrication (WP 0163).
- Perform suspension circuit bleeding (WP 0041).
- Adjust platform height and check for proper operation (WP 0005).

END OF WORK PACKAGE

FIELD MAINTENANCE**UPPER SUSPENSION ARM**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Lifting Strap (2) (WP 0168, Item 25)
Truck, Wrecker M984 (WP 0168, Item 26)
Standard Army Tool Set (WP 0168, Item 28)

Solvent, Cleaning Compound (WP 0170, Item 31)
Lockwasher (8)
Locknut (4)
Locknut (1)
Nonmetallic Seal (1)

Materials/Parts

Crocus Cloth, Abrasive (WP 0170, Item 6)
Grease (WP 0170, Item 16)
Rag, Wiping (WP 0170, Item 23)

Personnel Required

(3)

Equipment Conditions

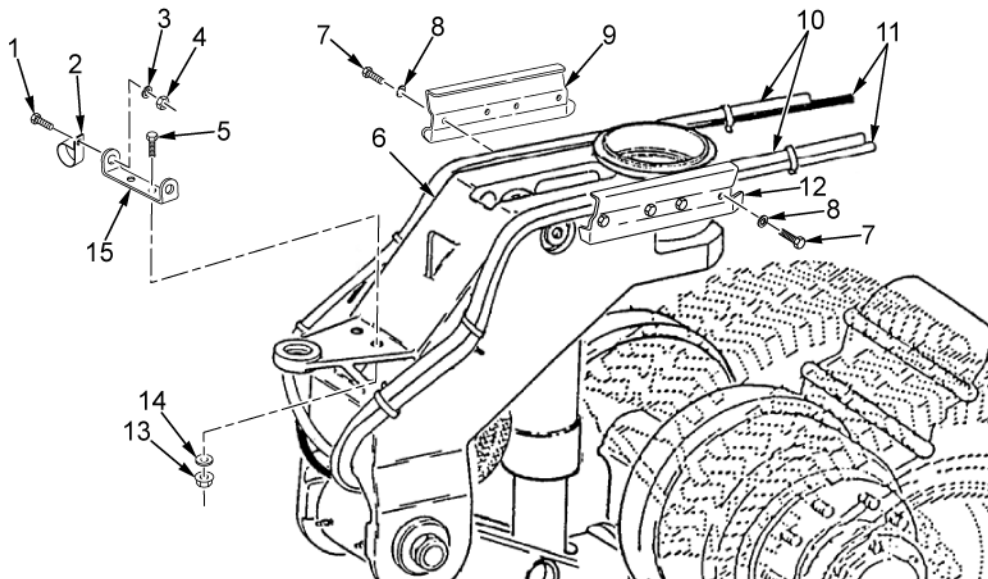
Suspension assembly removed from semitrailer (WP 0065)

GENERAL INFORMATION

This work package contains instructions for removal, repair, and installation of the upper suspension arm.

REMOVAL

1. Remove six capscrews (Figure 1, Item 7), lockwashers (Figure 1, Item 8), and hose shield (Figure 1, Item 9 and Item 12) from upper suspension arm (Figure 1, Item 6). Discard lockwashers.
2. Remove two locknuts (Figure 1, Item 4), washers (Figure 1, Item 3), capscrews (Figure 1, Item 1), and hose clamps (Figure 1, Item 2) from hose clamp bar (Figure 1, Item 15). Discard locknuts.
3. Remove two locknuts (Figure 1, Item 13), flatwashers (Figure 1, Item 14), capscrews (Figure 1, Item 5), and hose clamp bar (Figure 1, Item 15) from upper suspension arm (Figure 1, Item 6). Discard locknuts.
4. Move two air lines (Figure 1, Item 11) and two hydraulic hoses (Figure 1, Item 10) down and away from upper suspension arm (Figure 1, Item 6).



HETT0314

Figure 1. Removing Hose Shield.

NOTE

Wrap lifting strap(s) through the upper suspension arm casting to ensure the upper suspension arm will not accidentally slip or become misaligned.

5. Attach lifting strap(s) (Figure 2, Item 2) to upper suspension arm (Figure 2, Item 1). Attach lifting strap(s) to overhead lifting device.

NOTE

It may be necessary to use the crowbar to help raise the upper suspension arm. Once upper movement has started, the crowbar should no longer be necessary.

6. Operate overhead lifting device and start to raise upper suspension arm (Figure 2, Item 1) from lower suspension arm (Figure 2, Item 3). If necessary, use crowbar to help upper suspension arm to start moving.
7. Raise upper suspension arm (Figure 2, Item 1) enough so that top of arm is approximately parallel to the ground.
8. Disconnect upper pin and spacer assemblies on suspension cylinder from upper suspension arm (Figure 2, Item 1) (WP 0066).
9. Use 1-1/2 in. socket, 3/4 in. drive ratchet, 1 1/2 in. combination wrench, and two people to remove locknut (Figure 2, Item 4), capscrew (Figure 2, Item 7), and two access covers (Figure 2, Item 5) from upper and lower suspension arms (Figure 2, Item 1 and Item 3). Discard locknuts.

NOTE

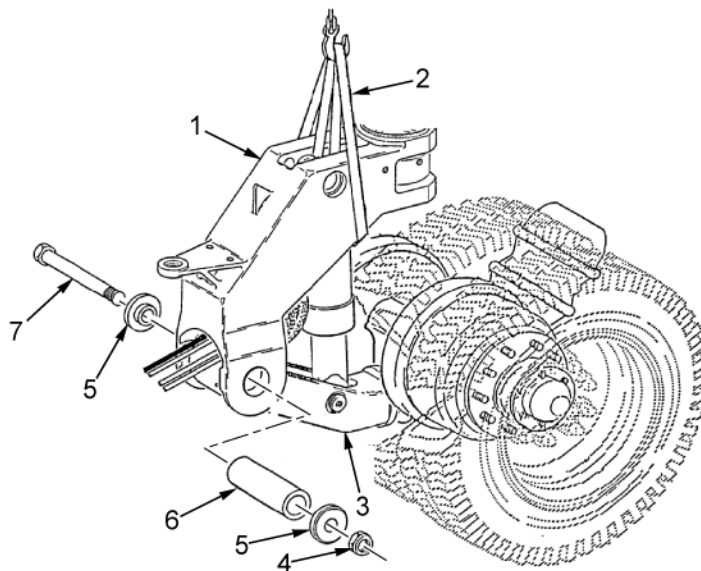
When in their normally installed position, the suspension arms mount together with the smaller end of the shoulder shaft toward the right-hand side of the suspension assembly. Thus, the shoulder shaft must be driven out starting from the right-hand side, driving toward the left-hand side of the suspension assembly.

10. Use hammer and brass drift to drive shoulder shaft (Figure 2, Item 6) from left-hand side of lower suspension arm (Figure 2, Item 3) and remove shoulder shaft from upper and lower suspension arms (Figure 2, Item 1).

NOTE

This step requires three people.

11. Use two people to maneuver overhead lifting device and upper suspension arm (Figure 2, Item 1) and one person to hold/support lower suspension arm (Figure 2, Item 3). Separate lower suspension arm from upper suspension arm by pulling overhead lifting device away from lower suspension arm.



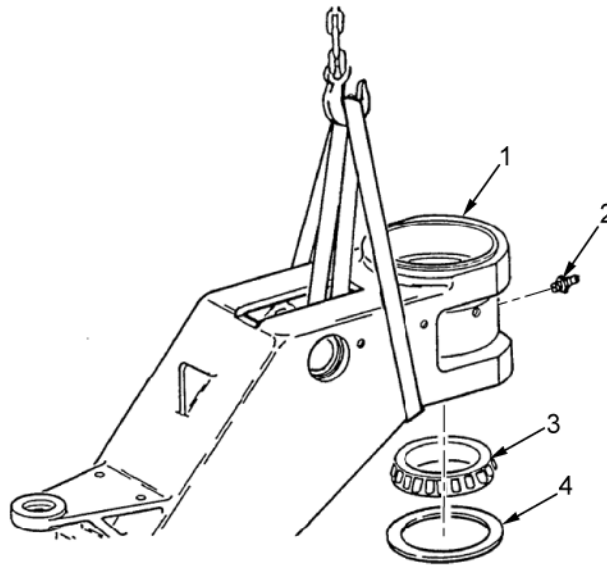
HETT0315

Figure 2. Access Covers to Upper and Lower Suspension Arms.

END OF TASK

REPAIR

1. Remove lubrication fitting (Figure 3, Item 2) from upper suspension arm (Figure 3, Item 1).
2. Use hammer and brass drift to drive lower bearing cone (Figure 3, Item 3) and nonmetallic seal (Figure 3, Item 4) out of bottom side of upper suspension arm (Figure 3, Item 1). Discard seal.

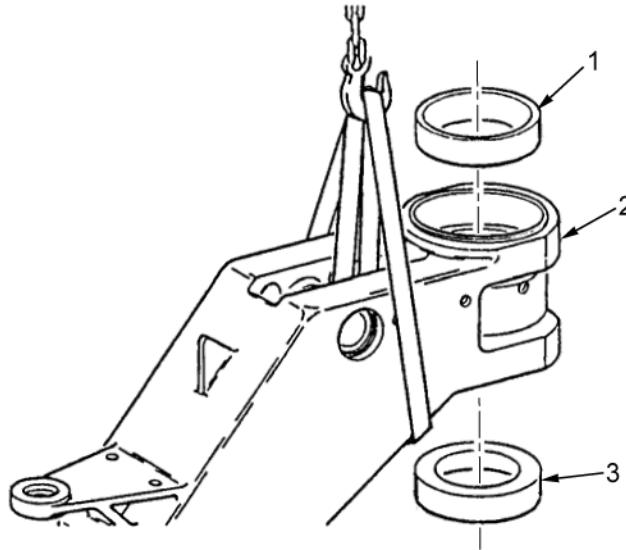


HETT0316

Figure 3. Lubricating Fitting and Bearing Cone Removal.

CAUTION

- **Alternate driving points on inner race of lower bearing cone when driving out lower bearing cone and nonmetallic seal, or damage to equipment may result.**
 - **Alternate driving points on bearing cups during removal, or damage to equipment may result.**
3. If necessary, use hammer and brass drift to drive lower bearing cup (Figure 4, Item 3) from upper suspension arm (Figure 4, Item 2).
 4. If necessary, use hammer and brass drift to drive upper bearing cup (Figure 4, Item 1) from upper suspension arm (Figure 4, Item 2).



HETT0317

Figure 4. Drive Lower Bearing Cup from Upper Suspension Arm.

WARNING**SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
 - The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
 - Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
 - Fire extinguishers should be placed nearby when using solvent cleaning compound.
 - Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
 - Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury. Failure to follow these warnings may result in injury or death to personnel.
5. Use wiping rags to clean all grease from inside of upper suspension arm cavity and all associated parts. Clean all parts removed using degreaser tank with cleaning solvent. Inspect upper and lower suspension arm castings; upper and lower bearing cups; lower bearing cone; and attaching hardware for cracks, gouges in castings, and corrosion. Replace defective parts.
 6. Use an abrasive crocus cloth to remove nicks and to polish scored surfaces. If casting has defects, replace casting.
 7. Inspect upper suspension bearing cone and platform spindle for cracks, gouges, scoring, excessive wear, and bent or loose bearing cage. If defects exist, notify field maintenance.
 8. Use grease, bearing lubricant packer, and lubricating handgun to pressure-pack lower suspension bearing cone per lubrication chart (WP 0163).

CAUTION

Use upper bearing cup removed during disassembly to help seat new bearing cup, or damage to new bearing cup may result.

9. Align upper bearing cup (Figure 5, Item 2) with upper suspension arm (Figure 5, Item 3), and use a soft-face hammer to start seating upper bearing cup.

CAUTION

Alternate driving points on upper bearing cup, or damage to equipment may result.

10. Align existing bearing cup (Figure 5, Item 1) over new upper bearing cup (Figure 5, Item 2), and use a hammer to start driving new bearing cup into upper suspension arm (Figure 5, Item 3).
11. Continue to drive upper bearing cup (Figure 5, Item 2) into upper suspension arm (Figure 5, Item 3) until firmly seated into casting of upper suspension arm.

CAUTION

Use lower bearing cup removed during repair to help seat new bearing, or damage to new bearing cup may result.

12. Align lower bearing cup (Figure 5, Item 5) with upper suspension arm (Figure 5, Item 3), and use a hammer with existing bearing cup (Figure 5, Item 1) to start seating lower bearing cup.

CAUTION

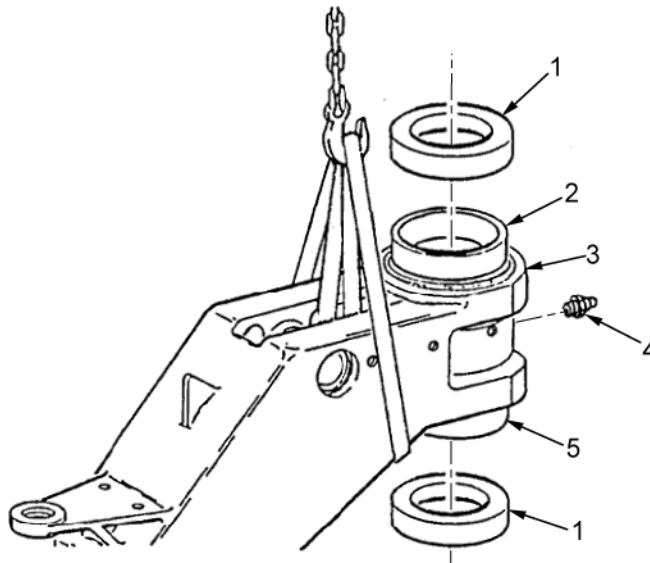
Alternate driving points on lower bearing cup during installation, or damage to equipment may result.

13. Align existing bearing cup (Figure 5, Item 1) over new lower bearing cup (Figure 5, Item 5), and use a hammer to start driving bearing cup into upper suspension arm (Figure 5, Item 3).
14. Continue to drive lower bearing cup (Figure 5, Item 5) into upper suspension arm (Figure 5, Item 3) until firmly seated into casting of upper suspension arm.

NOTE

Lower bearing cone and nonmetallic seal will not be reassembled in this procedure. The suspension assembly must be reinstalled onto the semitrailer platform. Installation of the above stated parts will be installed during the Suspension Assembly/Bogie procedure (WP 0065).

15. Install lubrication fitting (Figure 5, Item 4) to upper suspension arm (Figure 5, Item 3).



HETT0318

Figure 5. Seating Upper Bearing Cup.

END OF TASK

INSTALLATION

NOTE

This step requires three people.

1. Use two people to maneuver overhead lifting device and upper suspension arm (Figure 6, Item 1) and one person to hold/support lower suspension arm (Figure 6, Item 3) and to align upper suspension arm with lower suspension arm.
2. Apply grease to inside bore of assembly joint for both upper and lower suspension arms (Figure 6, Item 1 and Item 3) and to exterior of shoulder shaft (Figure 6, Item 6).

NOTE

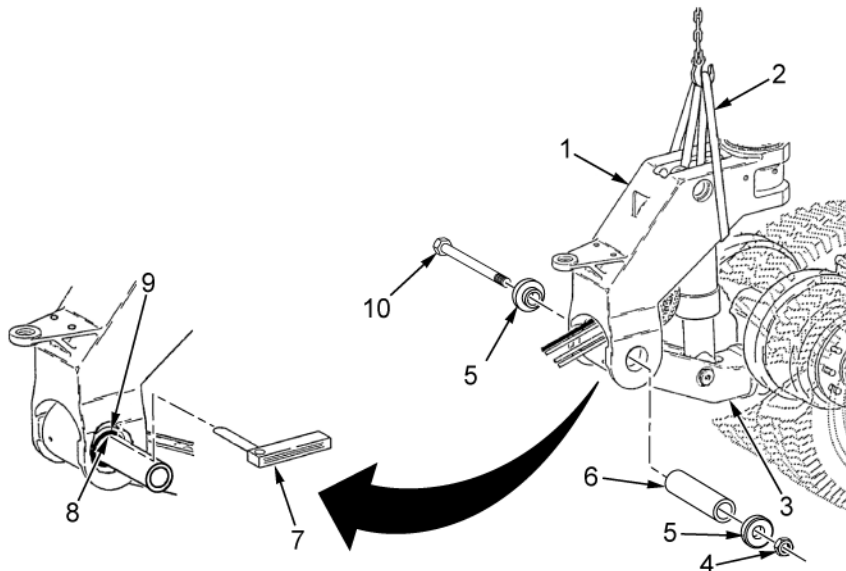
The shoulder shaft is 0.063 in. (1.6 mm) larger at one end. It may be necessary to measure both ends with accurate scale to determine which is the smaller end.

3. Insert smaller end of shoulder shaft (Figure 6, Item 6) through larger bore in upper suspension arm (Figure 6, Item 1) and into bore in lower suspension arm (Figure 6, Item 3) until shaft movement is stopped by lip at bearing oil seal (Figure 6, Item 9).
4. Use a 0.015 in. (0.381 mm) blade (Figure 6, Item 7) on 20-blade feeler gauge set inserted (Figure 6, Item 8) into smaller bore of upper suspension arm (Figure 6, Item 1) to carefully adjust position of lip of bearing oil seal (Figure 6, Item 9) up onto small end of shoulder shaft (Figure 6, Item 6).

CAUTION

If shoulder shaft is driven with excessive force, damage to the seals may result.

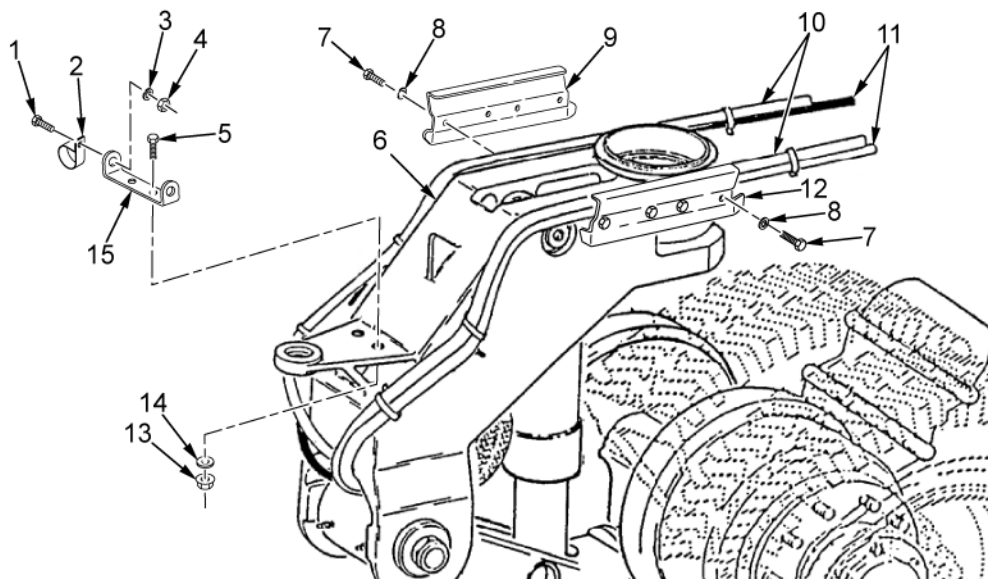
5. Drive shoulder shaft (Figure 6, Item 6) until smaller end extends through bearing oil seal (Figure 6, Item 9) and upper suspension arm (Figure 6, Item 1) bore.
6. Use 1-1/2 in. socket, 3/4 in. drive ratchet, 1-1/2 in. combination wrench, and two people to install two access covers (Figure 6, Item 5), capscrew (Figure 6, Item 10), and new locknut (Figure 6, Item 4) to upper and lower suspension arms (Figure 6, Item 1 and Item 3).
7. Align and install suspension cylinder into upper suspension arm (Figure 6, Item 1) and secure with upper pin and spacer assemblies (WP 0066).
8. Remove lifting strap(s) (Figure 6, Item 2) and overhead lifting device from upper suspension arm (Figure 6, Item 1).



HETT0319

Figure 6. Installing Shoulder Shaft.

9. Align two hydraulic hoses (Figure 7, Item 10) and air brake hoses (Figure 7, Item 11) into place on upper suspension arm (Figure 7, Item 6). Use one person to hold hoses until hose shields (Figure 7, Item 9 and Item 12) are installed and secured in place.
10. Align and install two hose shields (Figure 7, Item 9 and Item 12) onto upper suspension arm (Figure 7, Item 6), securing both air lines (Figure 7, Item 11) and hydraulic hoses (Figure 7, Item 10) in place. Secure hose shields in place by installing and loosely hand-tightening six capscrews (Figure 7, Item 7) and new lockwashers (Figure 7, Item 8).
11. Align hose clamp bar (Figure 7, Item 15) over upper suspension arm (Figure 7, Item 6) and secure in place with two capscrews (Figure 7, Item 5), flatwashers (Figure 7, Item 14), and new locknuts (Figure 7, Item 13).
12. Install two hose clamps (Figure 7, Item 2) onto two hydraulic lines (Figure 7, Item 10) and secure in place by installing two capscrews (Figure 7, Item 1), washers (Figure 7, Item 3), and new locknuts (Figure 7, Item 4).
13. Pull on both air lines (Figure 7, Item 11) and hydraulic hoses (Figure 7, Item 10) to remove excess slack in lines.
14. Tighten six capscrews (Figure 7, Item 7) to secure hose shields (Figure 7, Item 9 and Item 12).



HETT0320

Figure 7. Installation and Alignment of Hoses.

END OF TASK**FOLLOW-ON MAINTENANCE**

Install suspension assembly onto platform (WP 0065).

Perform required lubrication to suspension assembly (WP 0163).

END OF WORK PACKAGE

FIELD MAINTENANCE**SERVICE BRAKES**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Lockwasher (4)

Personnel Required

1

Materials/Parts

Crocus Cloth, Abrasive (WP 0170, Item 6)
Solvent, Cleaning Compound (WP 0170, Item 31)

Equipment Conditions

Hub and drum removed (WP 0075)

GENERAL INFORMATION

This work package contains instructions for removal, inspection, and installation of the service brakes.

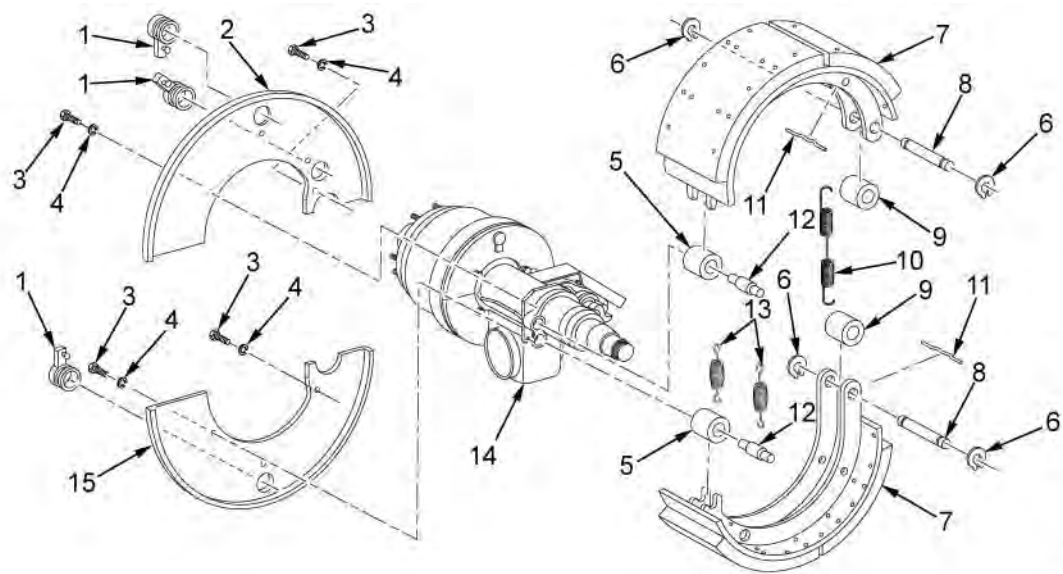
REMOVAL**WARNING**

When trailer has performed heavy braking, the brake drums should be HOT to the touch. Use caution and do not come in contact with the brake drum to check for heat. Allow brake drum to cool before performing maintenance, or injury to personnel may result.

CAUTION

Brake adjustments (WP 0037) are mandatory after installing new brakes or performing maintenance on brakes. Brake adjustments also must be performed if any of the following conditions exist or damage to equipment may result:

- **Slack adjusters are not level with each other when brakes are applied.**
 - **Brake chamber clevis moves more than 2 in. (5.1 cm) from fully released condition to fully engaged condition.**
 - **Brake drum temperature is cool to the touch after heavy braking operations have been performed.**
1. Remove four capscrews (Figure 1, Item 3), lockwashers (Figure 1, Item 4), upper dust shield (Figure 1, Item 2), and lower dust shield (Figure 1, Item 15) from axle assembly (Figure 1, Item 14). Discard lockwashers.
 2. Lift or lower each brake shoe (Figure 1, Item 7) from headless shoulder pins (Figure 1, Item 12) mounted on axle assembly (Figure 1, Item 14) and drive out two headless shoulder pins.
 3. Use brake repair pliers to remove two helical extension springs (Figure 1, Item 13) from brake shoes (Figure 1, Item 7).
 4. Pull and remove two brake shoes (Figure 1, Item 7) from axle assembly (Figure 1, Item 14). Remove helical extension spring (Figure 1, Item 10) from brake shoes and separate brake shoes.
 5. Remove two return spring pins (Figure 1, Item 11) from brake shoes (Figure 1, Item 7).
 6. Use retaining ring pliers to remove four retaining rings (Figure 1, Item 6), two headless grooved pins (Figure 1, Item 8), and rollers (Figure 1, Item 9) from brake shoes (Figure 1, Item 7).
 7. Inspect anchor pin bushings (Figure 1, Item 5) for gouges, scoring, and defects. If required, drive two anchor pin bushings from axle assembly (Figure 1, Item 14).
 8. If necessary, remove three plugs (Figure 1, Item 1) from dust shields (Figure 1, Item 2 and Item 15).



HETT0321

Figure 1. Dust Shields Removal.

END OF TASK

INSPECTION

WARNING**SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
- The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound.
- Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.

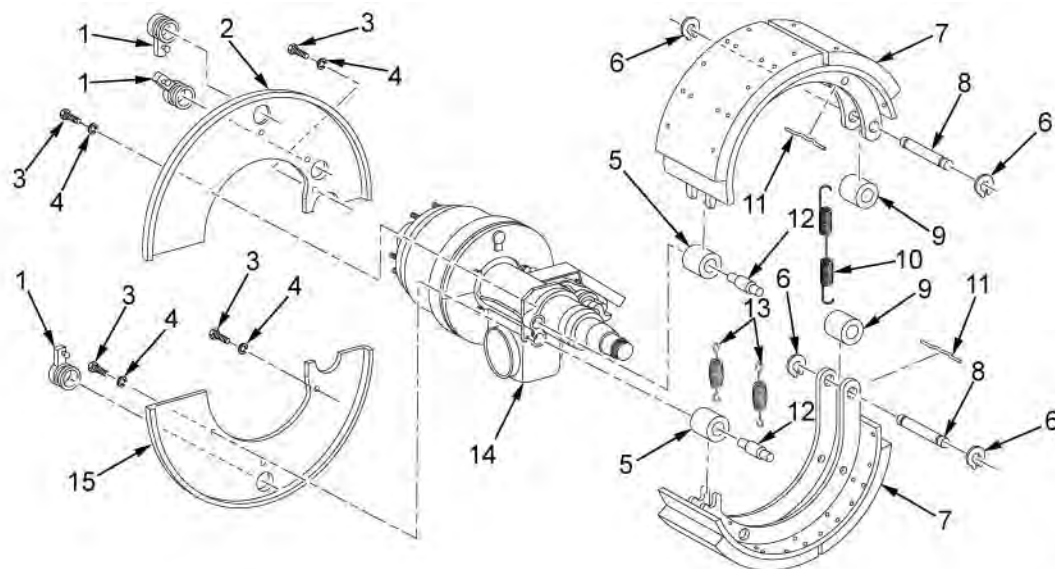
Failure to follow these warnings may result in injury or death to personnel.

1. Clean all parts removed in degreaser tank with cleaning compound solvent. Remove any burrs and scoring from polished surfaces using crocus cloth. Inspect brake shoe linings for uneven wear, improper lining grind, bent shoes, scratches, breaks, or cracks. If any defects exist, replace brake shoe assembly.
2. Inspect dust shields for cracks, deformation, missing hardware, and damaged or missing plugs. Replace defective dust shields.
3. Measure overall shoe lining thickness. If shoe linings are less than 0.46 in. (0.76 cm) thick, replace brake shoe assembly.

END OF TASK

INSTALLATION

1. If removed, install three dust plugs (Figure 2, Item 1) into dust shields (Figure 2, Item 2, and Item 15).
2. If removed, install two anchor pin bushings (Figure 2, Item 5) into axle assembly (Figure 2, Item 13).
3. Install two rollers (Figure 2, Item 9) onto brake shoes (Figure 2, Item 7) and insert two headless grooved pins (Figure 2, Item 8) through two rollers to hold brake shoes in place.
4. Use retaining ring pliers to install four retaining rings (Figure 2, Item 6) onto two headless grooved pins (Figure 2, Item 8) to secure rollers (Figure 2, Item 9) in place.
5. Align and install two return spring pins (Figure 2, Item 11) into brake shoes (Figure 2, Item 7).
6. Install helical extension spring (Figure 2, Item 10) between both brake shoes (Figure 2, Item 7) onto return spring pins (Figure 2, Item 11).
7. Align and install two brake shoes (Figure 2, Item 7) so that each roller (Figure 2, Item 9) seats on S-cam on axle assembly (Figure 2, Item 13).
8. Use brake repair pliers to install helical extension springs (Figure 2, Item 14) on brake shoes (Figure 2, Item 7).
9. Lift or lower each brake shoe (Figure 2, Item 7) until headless shoulder pins (Figure 2, Item 12) can be installed, and install two headless shoulder pins into anchor pin bushings (Figure 2, Item 5).
10. Align and install both upper and lower dust shields (Figure 2, Item 2 and Item 15) onto axle assembly (Figure 2, Item 13) and secure with four new lockwashers (Figure 2, Item 4) and capscrews (Figure 2, Item 3).



HETT0321

Figure 2. Dust Shields Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Reinstall hub and drum (WP 0075).

Perform service brake adjustment (WP 0037).

If brakes were adjusted, operate tractor/semitrailer and check for proper operation (WP 0014).

END OF WORK PACKAGE

FIELD MAINTENANCE**S-CAM**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Cotter Pin (1)
Nonmetallic Seal (2)
Preformed Packing (2)

Materials/Parts

Crocus Cloth, Abrasive (WP 0168, Item 6)
Grease (WP 0170, Item 16)
Rag, Wiping (WP 0170, Item 23)
Solvent, Cleaning Compound (WP 0170, Item 31)

Personnel Required

1

Equipment Conditions

Hub and drum removed (WP 0075)
Brake assembly removed (WP 0068)

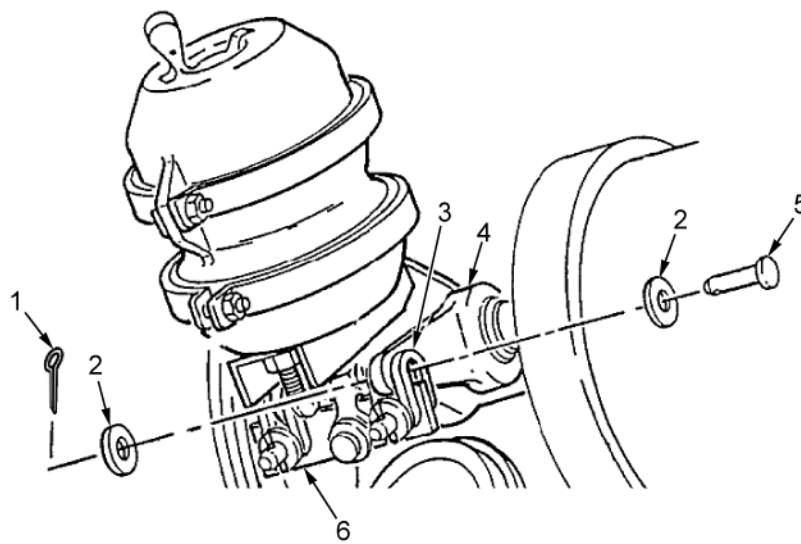
GENERAL INFORMATION

This work package contains instructions for removal, inspection, and installation of the S-cam.

REMOVAL**NOTE**

Use the following procedure for either the left-hand or right-hand S-cam. Repeat this procedure as required to complete the necessary repairs.

1. Remove cotter pin (Figure 1, Item 1), two flat washers (Figure 1, Item 2), and headed shoulder pin (Figure 1, Item 5) from mending plate (Figure 1, Item 6), rod end clevis (Figure 1, Item 3), and slack adjuster (Figure 1, Item 4). Discard cotter pin.



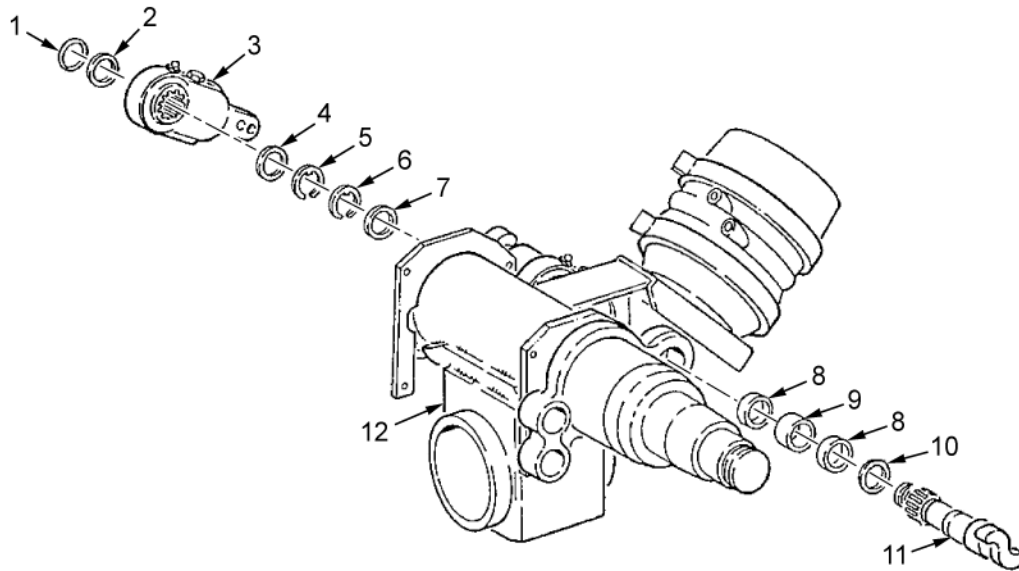
HETT0322

Figure 1. Mending Plate Removal.

CAUTION

The S-cam has parts that are removed as the S-cam is removed. During removal, ensure that none of the washers become lost or lodged in the retaining ring groove or damage to the equipment may result.

2. Remove retainer rings (Figure 2, Item 5 and Item 6) from brake actuating S-cam (Figure 2, Item 11). Using a soft plastic head hammer, drive S-cam from axle (Figure 2, Item 12).
3. Remove flat washer (Figure 2, Item 2), slack adjuster (Figure 2, Item 3), spacer (Figure 2, Item 4), flat washer (Figure 2, Item 7), flat washer (Figure 2, Item 10), and preformed packings (Figure 2, Item 1) from S-cam (Figure 2, Item 11) as it is being removed. Discard preformed packings.
4. Remove two nonmetallic seals (Figure 2, Item 8) from axle (Figure 2, Item 12). Discard seals.
5. Remove bushing (Figure 2, Item 9) from axle (Figure 2, Item 12).



HETT0323

Figure 2. S-cam Retaining Rings Removal.

END OF TASK

INSPECTION

WARNING**SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
- The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound.
- Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with (IAW) authorized facilities' procedures.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.

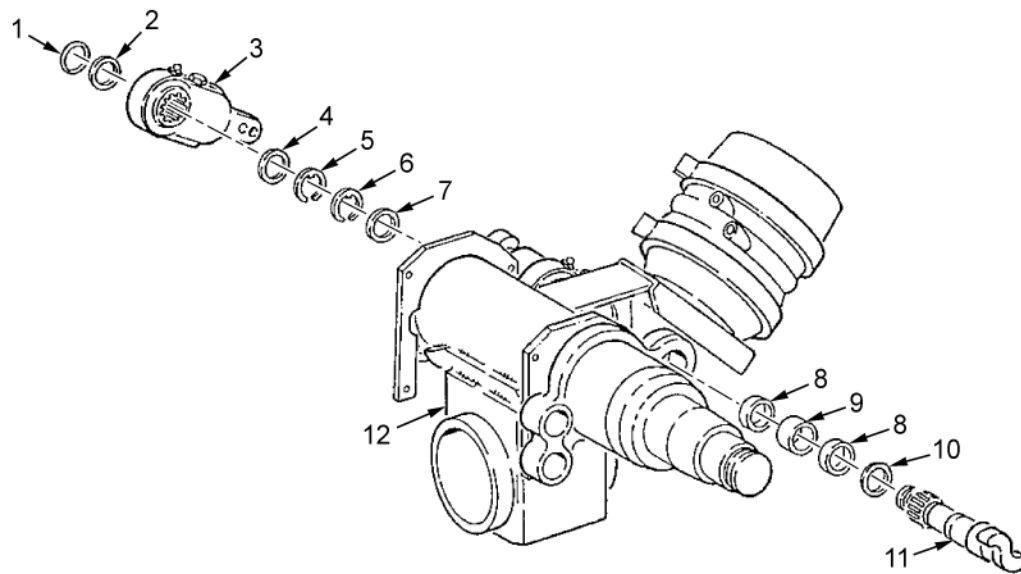
Failure to follow these warnings may result in injury or death to personnel.

1. Inspect bushings, spacers, and washers for wear, out-of-round, corrosion, nicks, and burrs. Clean all parts removed in degreaser tank with cleaning compound solvent. Remove burrs, nicks, and scoring on polished surfaces using crocus cloth. Replace all defective parts.
2. Inspect brake operating S-cam camshaft and related parts for wear, worn gear, broken cam, scoring, out-of-round, corrosion, nicks, and burrs. Clean all corroded parts in degreaser tank with cleaning compound solvent. Remove burrs, nicks, and scoring on polished surfaces using crocus cloth. Replace all defective parts.

END OF TASK

INSTALLATION

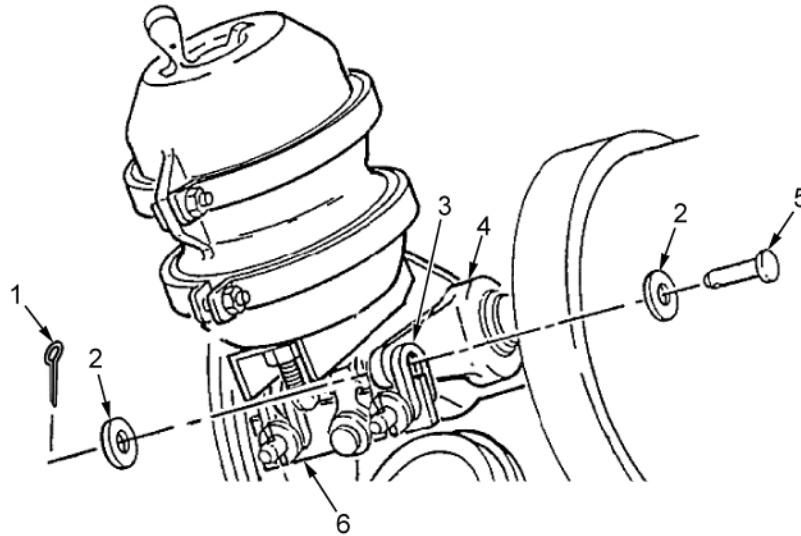
1. Install bushing (Figure 3, Item 9) into axle (Figure 3, Item 12).
2. Apply a light coating of grease to two nonmetallic seals (Figure 3, Item 8) and install two nonmetallic seals onto axle (Figure 3, Item 12).
3. Install preformed packing (Figure 3, Item 1) and flat washer (Figure 3, Item 2) onto S-cam (Figure 3, Item 11).
4. Align and install S-cam (Figure 3, Item 11) into axle (Figure 3, Item 12). Once S-cam passes through nonmetallic seals (Figure 3, Item 8), install flat washers (Figure 3, Item 10 and Item 7) and spacer (Figure 3, Item 4).
5. Place slack adjuster (Figure 3, Item 3) near axle (Figure 3, Item 12) and align with S-cam (Figure 3, Item 11). Push S-cam through slack adjuster and install flat washer (Figure 3, Item 2) onto S-cam as it clears slack adjuster.
6. Continue pushing S-cam (Figure 3, Item 11) until S-cam and flat washer (Figure 3, Item 2) are flush against S-cam assembly on axle (Figure 3, Item 12).
7. Install retainer rings (Figure 3, Item 6 and Item 5) onto S-cam (Figure 3, Item 11).



HETT0323

Figure 3. Retaining Rings Installation.

8. Align mending plate (Figure 4, Item 6) with rod end clevis (Figure 4, Item 3) and slack adjuster (Figure 4, Item 4). Secure rod end clevis and slack adjuster with headed shoulder pin (Figure 4, Item 5), two flat washers (Figure 4, Item 2), and cotter pin (Figure 4, Item 1).



HETT0322

Figure 4. Mending Plate Alignment and Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Lubricate axle as required (WP 0163).

Operate tractor/semitrailer and check for proper brake operation (WP 0014).

END OF WORK PACKAGE

FIELD MAINTENANCE

S-CAM RETAINER ASSEMBLY

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Preformed Packing (2)

Personnel Required

1

Materials/Parts

Grease (WP 0170, Item 16)
Petroleum Jelly (WP 0170, Item 21)
Rag, Wiping (WP 0170, Item 23)

Equipment Conditions

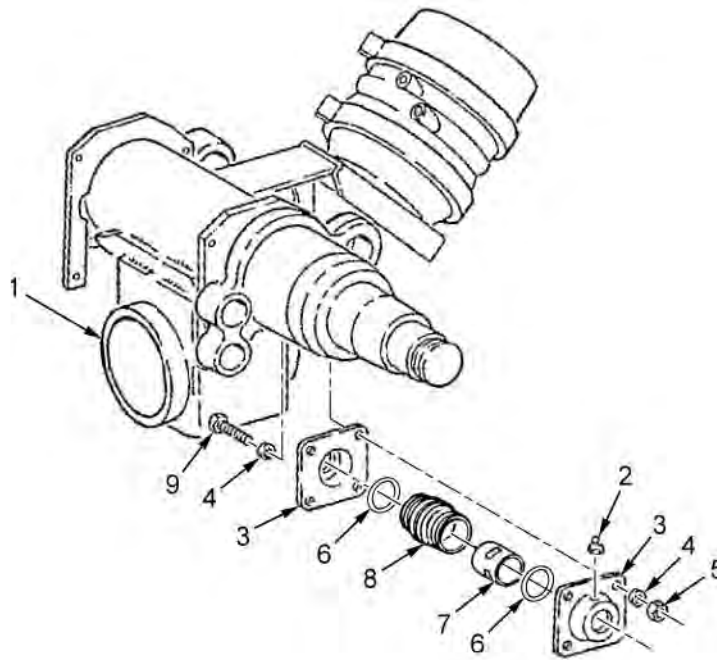
Left-hand and right-hand S-cam (WP 0069) and slack adjusters (WP 0071) removed

GENERAL INFORMATION

This work package contains instructions for removal and installation of the S-cam retainer assembly.

REMOVAL

1. Remove four nuts (Figure 1, item 5), capscrews (Figure 1, Item 9), and eight flatwashers (Figure 1, Item 4) from S-cam retainer assembly (Figure 1, Item 3) and axle (Figure 1, Item 1).
2. Remove S-cam retainer assembly (Figure 1, Item 3) from axle (Figure 1, Item 1).
3. Separate two halves of S-cam retainer assembly (Figure 1, Item 3). Remove two preformed packings (Figure 1, Item 6), sleeve bushing (Figure 1, Item 8), and camshaft bushing (Figure 1, Item 7) from S-cam retainer assembly. Discard preformed packings.
4. Remove lubricating fitting (Figure 1, Item 2) from S-cam retainer assembly (Figure 1, Item 3).



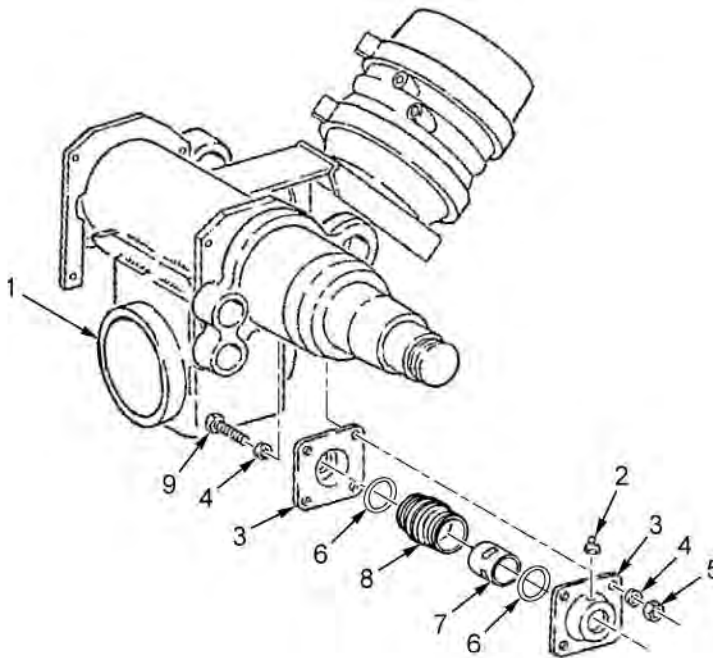
HETT0325

Figure 1. Retainer Assembly Removal.

END OF TASK

INSTALLATION

1. Install lubrication fitting (Figure 2, Item 2) on S-cam retainer assembly (Figure 2, Item 3).
2. Install camshaft bushing (Figure 2, Item 7), sleeve bushing (Figure 2, Item 8), and two new preformed packings (Figure 2, Item 6) on S-cam retainer assembly (Figure 2, Item 3). Assemble two halves of the S-cam retainer assembly.
3. Install S-cam retainer assembly (Figure 2, Item 3) with four capscrews (Figure 2, Item 4), eight flatwashers (Figure 2, Item 9), and four nuts (Figure 2, Item 5) onto axle (Figure 2, Item 1). Use a torque wrench to torque nuts to 30 to 40 lb-ft (41 to 54 Nm).



HETT0325

Figure 2. Retainer Assembly Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Install left-hand and right-hand S-cam and slack adjusters (WP 0069 and WP 0071).

END OF WORK PACKAGE

FIELD MAINTENANCE**SLACK ADJUSTER**

INITIAL SETUP:**Personnel Required**

1

Equipment Conditions

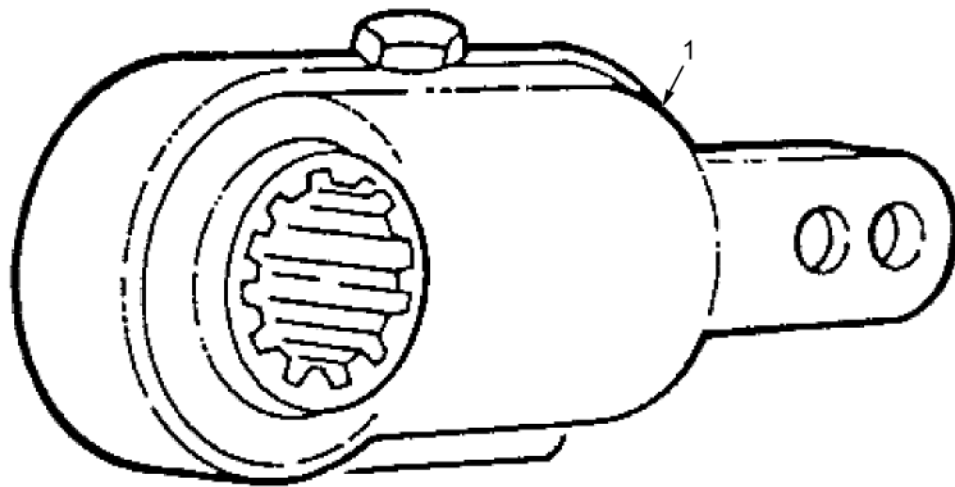
S-cam for defective slack adjuster removed (WP 0069)

GENERAL INFORMATION

This work package contains instructions for inspection of the slack adjuster.

INSPECTION

1. Inspect slack adjuster (Figure 1, Item 1) for wear, worn or broken gear teeth, broken/cracked housing, scoring, out-of-round condition, corrosion, burrs, broken or bent locking tabs, rounded off or stripped adjusting nuts, or broken/missing lubrication fittings.
2. Replace defective parts (WP 0069) with new slack adjuster during installation of S-cam.



HETT0326

Figure 1. Slack Adjuster.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**AIR CLEANER ASSEMBLY**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Personnel Required

1

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Petroleum Jelly (WP 0170, Item 21)
Pipe Sealant (WP 0170, Item 22)
Preformed Packing (1)
Filter Element (1)

Equipment Conditions

Gooseneck lowered to lowest position, if uncoupled
(WP 0007)
Front and rear support legs lowered supporting platform
(WP 0011 and WP 0012)

GENERAL INFORMATION

This work package contains instructions for removal, assembly, and installation of the air cleaner assembly.

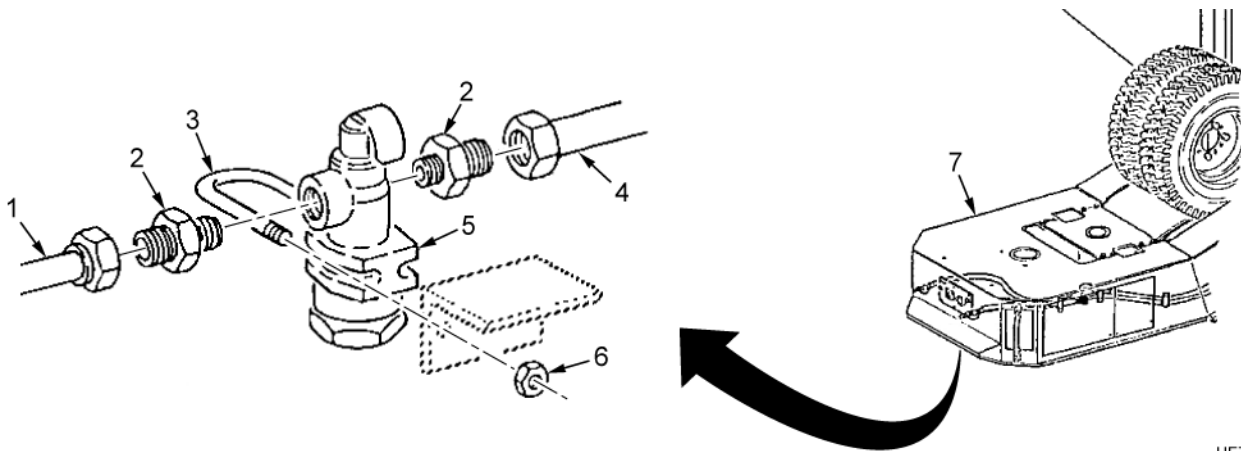
REMOVAL**WARNING**

If Nuclear, Biological, and Chemical (NBC) exposure is suspected, all air filter media should be handled by personnel wearing protective equipment. Consult your unit NBC Officer or NBC Noncommissioned Officer (NCO) for appropriate handling or disposal instructions.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or foreign material from entering the air brake system or damage to equipment may result.

1. Tag and disconnect two nonmetallic hoses (Figure 1, Item 1 and Item 4) from straight adapters (Figure 1, Item 2) on air filter assembly (Figure 1, Item 5). Install caps/plugs into hose openings.
2. Remove two nuts (Figure 1, Item 6) from U-bolt (Figure 1, Item 3) and remove U-bolt and air filter assembly (Figure 1, Item 5) from gooseneck (Figure 1, Item 7).
3. Remove two straight adapters (Figure 1, Item 2) from air filter assembly (Figure 1, Item 5). Install caps/plugs into all remaining openings.



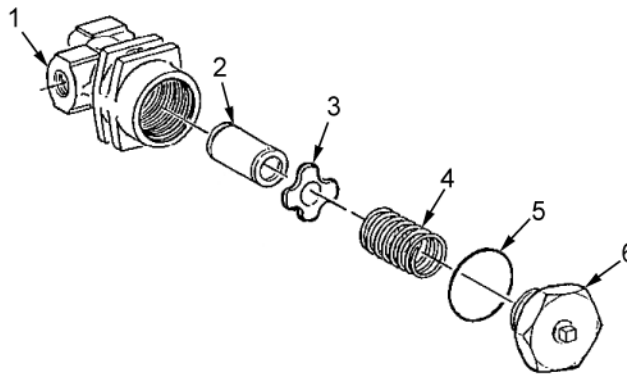
HETT0327

Figure 1. Air Filter Assembly Removal.

WARNING

The air filter assembly has an internal spring that, when assembled, is under pressure. Use caution when removing the housing nut or injury to personnel may result.

4. Remove assembly nut (Figure 2, Item 6), preformed packing (Figure 2, Item 5), spring (Figure 2, Item 4), and washer (Figure 2, Item 3) from air filter assembly (Figure 2, Item 1). Discard preformed packing.
5. Pull air filter element (Figure 2, Item 2) out of air filter assembly (Figure 2, Item 1). Discard air filter element.
6. Inspect air filter assembly (Figure 2, Item 1) for broken or cracked housing, cracked or stripped threads, and corrosion. If corroded, clean as required. If defective, replace as required.
7. Inspect internal components of air filter assembly (Figure 2, Item 1) for defects. Replace all parts found defective.



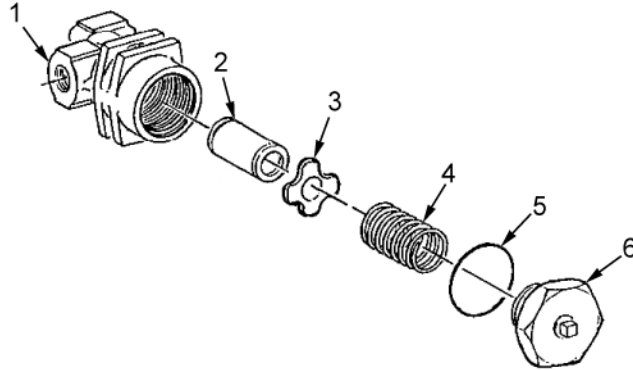
HETT0827

Figure 2. Air Filter Assembly Removal.

END OF TASK

ASSEMBLY

1. Install new air filter element (Figure 3, Item 2) into air filter assembly (Figure 3, Item 1).
2. Apply petroleum jelly to new preformed packing (Figure 3, Item 5). Install new preformed packing onto assembly nut (Figure 3, Item 6).
3. Install washer (Figure 3, Item 3) and spring (Figure 3, Item 4) into air filter assembly (Figure 3, Item 1) and secure in place with assembly nut (Figure 3, Item 6). Use torque wrench to torque assembly nut to 10 to 50 lb-ft (13.5 to 67.7 Nm).



HETT0827

Figure 3. Assembly of Air Filter Assembly.

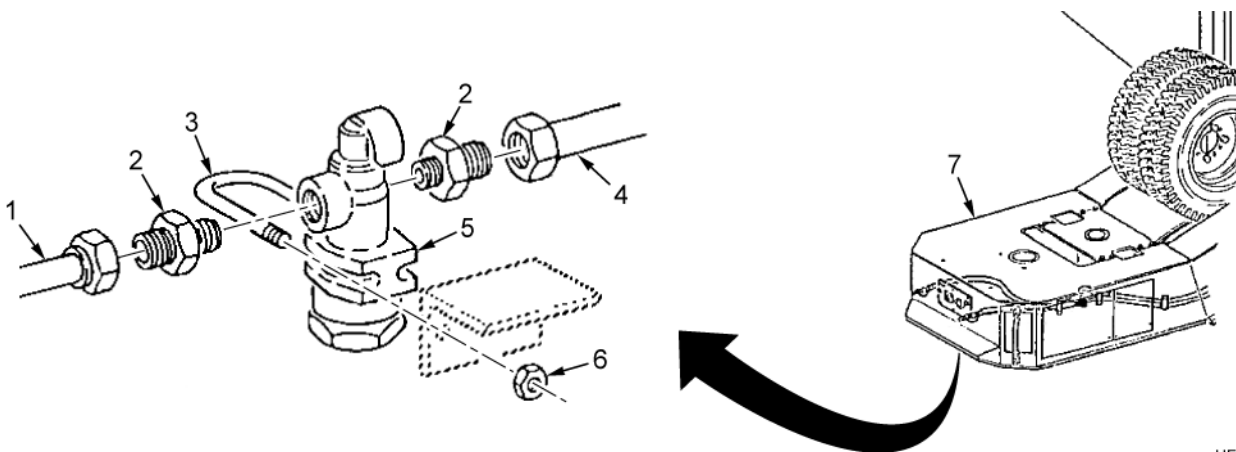
END OF TASK

INSTALLATION**WARNING**

- Adhesives, solvents, and sealing compounds may burn easily, may give off harmful vapors, and are harmful to skin and clothing. Keep away from open flames and use in well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.
- On direct contact, uncured silicone sealant irritates eyes. In case of contact, flush eyes with water and seek medical attention. In case of skin contact, wipe off and flush with water.

Failure to follow these warnings may result in injury or death to personnel.

1. Apply pipe sealant to threads of two straight adapters (Figure 4, Item 2). Align and install two straight adapters into air filter assembly (Figure 4, Item 5).
2. Align air filter assembly (Figure 4, Item 5) with mounting bracket on gooseneck (Figure 4, Item 7) and install U-bolt (Figure 4, Item 3) with two nuts (Figure 4, Item 6).
3. Align and install two nonmetallic hoses (Figure 4, Item 1 and Item 4) onto two straight adapters (Figure 4, Item 2).



HETT0327

Figure 4. Installation of Air Filter Assembly.

END OF TASK**FOLLOW-ON MAINTENANCE**

Couple tractor/semitrailer (WP 0013).

Drive tractor/semitrailer (WP 0014) and check for proper brake operation and air leaks.

END OF WORK PACKAGE

FIELD MAINTENANCE**GOOSENECK PNEUMATIC INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)

Personnel Required

1

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)

Petroleum Jelly (WP 0170, Item 21)

Pipe Sealant (WP 0170, Item 22)

Locknut (5)

Preformed Packing (2)

Equipment Conditions

Air cleaner assembly removed (WP 0072)

Gooseneck component assembly pulled out of gooseneck,
not removed (WP 0045)

GENERAL INFORMATION

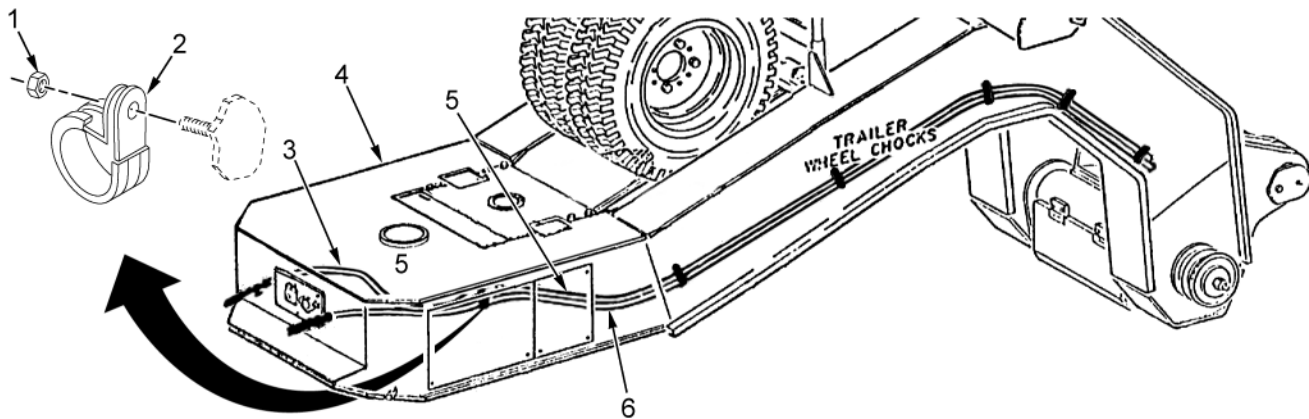
This work package contains instructions for removal, repair, and installation of the gooseneck pneumatic installation.

REMOVAL**CAUTION**

All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or foreign material from entering the pneumatic system, or damage to equipment may result.

NOTE

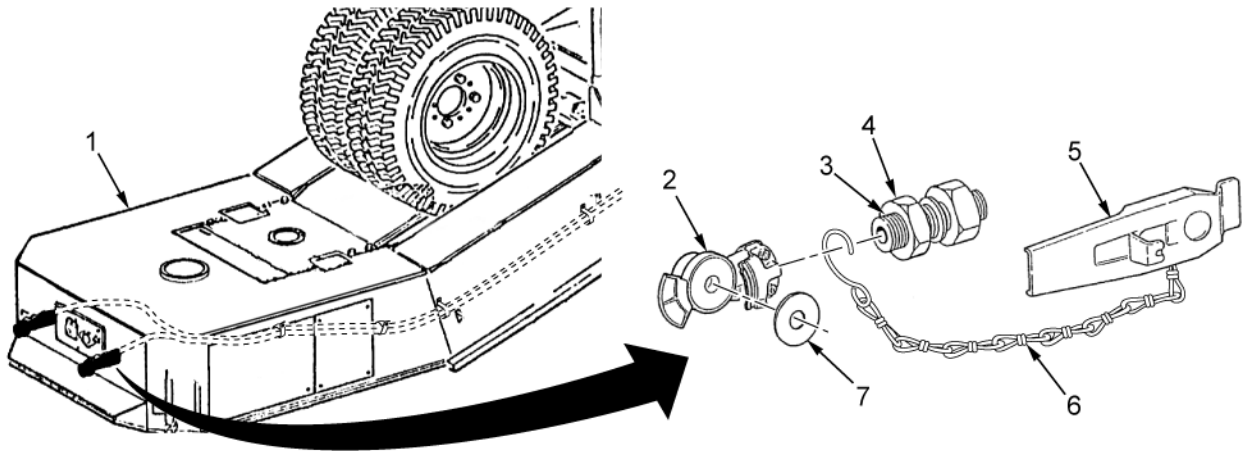
- Perform this procedure, or any portion of this procedure, as required, to complete the necessary repair.
 - Nonmetallic hoses are all manufactured items and are addressed in WP 0164. The following procedures identify the removal/installation of associated pneumatic fittings only.
1. Tag and disconnect three nonmetallic hoses (Figure 1, Item 3, Item 5, and Item 6) from gooseneck (Figure 1, Item 4) (WP 0044). Install caps/plugs into all openings.
 2. Remove five locknuts (Figure 1, Item 1) and clamp loops (Figure 1, Item 2) from gooseneck (Figure 1, Item 4). Discard locknuts.
 3. Remove three nonmetallic hoses (Figure 1, Item 3, Item 2, and Item 6) from gooseneck (Figure 1, Item 4).



HETT0328

Figure 1. Hose Removal.

4. Remove two dummy couplings (Figure 2, Item 5) with chains (Figure 2, Item 6) from quick-disconnect couplings (Figure 2, Item 2) located on front of gooseneck (Figure 2, Item 1).
5. Remove two quick-disconnect couplings (Figure 2, Item 2) and dummy couplings (Figure 2, Item 5) from straight adapters (Figure 2, Item 3).
6. Remove two preformed packings (Figure 2, Item 7) from two quick-disconnect couplings (Figure 2, Item 2). Discard preformed packings.
7. Remove nuts (Figure 2, Item 4) from two straight adapters (Figure 2, Item 3) and remove two straight adapters from gooseneck (Figure 2, Item 1). Reinstall nuts to straight adapters.



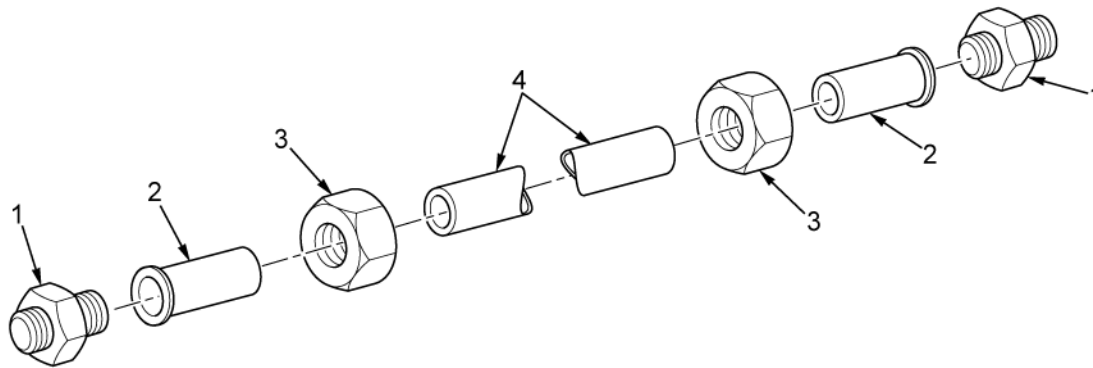
HETT0330

Figure 2. Removing Straight Adapters from Gooseneck.

END OF TASK

REPAIR

1. Inspect nonmetallic hoses (Figure 3, Item 4) removed for kinks, splits, deterioration, chaffing, cuts, and loose fittings. Repair defective hoses and fittings.
2. Inspect fittings, dummy couplings, and quick-disconnect couplings for nicks, burrs, corrosion, stripped or cracked threads, broken castings, and pitting. Replace defective parts, as required.
3. Obtain new fittings and bulk nonmetallic hose.
4. Refer to WP 0164 and cut new nonmetallic hose (Figure 3, Item 4) to specified length.
5. Install fitting nut (Figure 3, Item 3), small opening first, onto nonmetallic hose (Figure 3, Item 4). Install sleeve fitting (Figure 3, Item 2) onto end of nonmetallic hose.
6. Push adapter fitting (Figure 3, Item 1) over sleeve fitting (Figure 3, Item 2) and nonmetallic hose (Figure 3, Item 4) as far as possible by hand, and tighten fitting nut (Figure 3, Item 3) to adapter fitting.
7. Install caps and plugs into openings in manufactured hose until ready for installation.
8. Repeat steps 5 through 7 to install new fittings onto other end of nonmetallic hose (Figure 3, Item 4).



HETT0329

Figure 3. Assembly of Hose Fittings.

END OF TASK

INSTALLATION

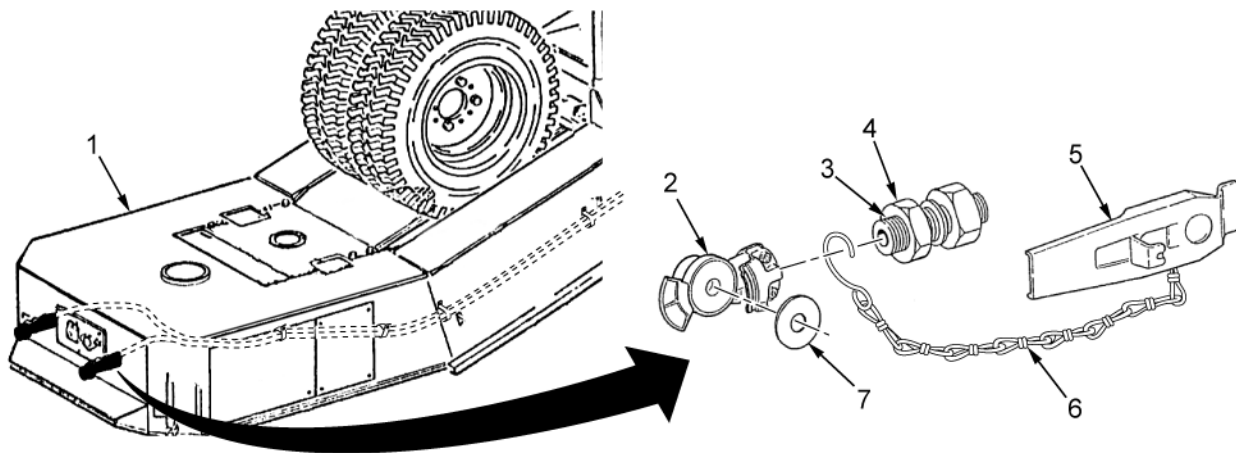
WARNING



- Adhesives, solvents, and sealing compounds may burn easily, may give off harmful vapors, and are harmful to skin and clothing. Keep away from open flames and use in well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.
- On direct contact, uncured silicone sealant irritates eyes. In case of contact, flush eyes with water and seek medical attention. In case of skin contact, wipe off and flush with water.

Failure to follow these warnings may result in injury or death to personnel.

1. Remove nuts (Figure 4, Item 4) on two straight adapters (Figure 4, Item 3) and align and install two straight adapters onto gooseneck (Figure 4, Item 1). Reinstall nuts onto adapters.
2. Apply pipe sealant to both ends of two straight adapters (Figure 4, Item 3). On front of gooseneck (Figure 4, Item 1) align and install two quick-disconnect couplings (Figure 4, Item 2) and secure chain (Figure 4, Item 6) onto two dummy couplings (Figure 4, Item 5) and two straight adapters.
3. Apply petroleum jelly to two new preformed packings (Figure 4, Item 7) and install two preformed packings onto two quick-disconnect couplings (Figure 4, Item 2).



HETT0330

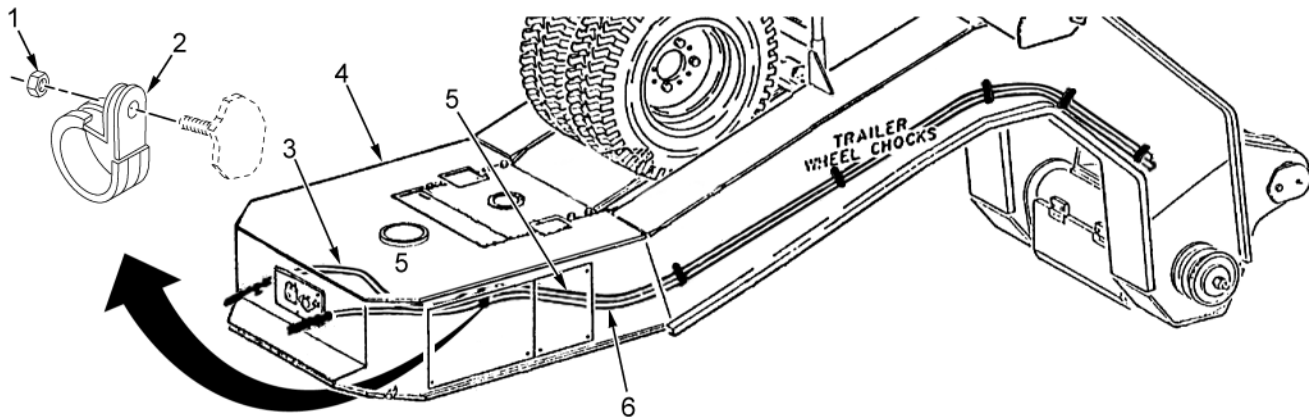
Figure 4. Installation of Straight Adapters and Couplings for Gooseneck.

4. Install three nonmetallic hoses (Figure 5, Item 3, Item 5, and Item 6) onto gooseneck (Figure 5, Item 4).

NOTE

Insert nearby nonmetallic hoses into clamp loops as the clamp loops are installed/secured to the gooseneck.

5. Align and install five clamp loops (Figure 5, Item 2) onto gooseneck (Figure 5, Item 4) and secure in place with new locknuts (Figure 5, Item 1).
6. Apply pipe sealant to threads of three nonmetallic hoses (Figure 5, Item 3, Item 5, and Item 6) and align and install three nonmetallic hoses.



HETT0328

Figure 5. Installing Hoses.

END OF TASK

FOLLOW-ON MAINTENANCE

Couple tractor/semitrailer (WP 0013).

Drive tractor/semitrailer (WP 0014) and check for proper brake operation and air leaks.

END OF WORK PACKAGE

FIELD MAINTENANCE
PLATFORM PNEUMATIC INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Pipe Sealant (WP 0170, Item 22)
Strap, Tiedown, Electrical (as required) (WP 0170, Item 33)
Lockwasher (4)
Locknut (12)
Lockwasher (5)
Lockwasher (18)
Cotter Pin (10)

Personnel Required

1

Equipment Conditions

Platform adjusted to 50 in. (127 cm) height (WP 0008)
Suspension isolation valves closed at four corner bogies (WP 0004)
Brake chambers caged (WP 0023)
Gooseneck lowered to lowest position, if uncoupled (WP 0007)
All five air tanks drained by pulling on air tank lanyards (WP 0004)
Platform steps and service covers removed (WP 0090)

GENERAL INFORMATION

This work package contains instructions for the removal, repair, and installation of the platform pneumatic installation and urethane bushing repair.

REMOVAL**CAUTION**

All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or foreign material from entering the platform pneumatic system or damage to equipment may result.

NOTE

- This procedure is for removal/installation of all platform pneumatic components. Perform this procedure or any portion of this procedure, as required, to complete the necessary repair.
- Nonmetallic hoses are all manufactured items and are addressed in WP 0164. The following procedure calls out removal/installation of associated pneumatic fittings only. Use the pneumatic schematic rear foldout Figure FO-2 as a general guide for hose routing.
- Figure 1 will be use as a guide for all procedures steps in this work package. Figure titles will have a location named in them for ease of finding components on underside of trailer.

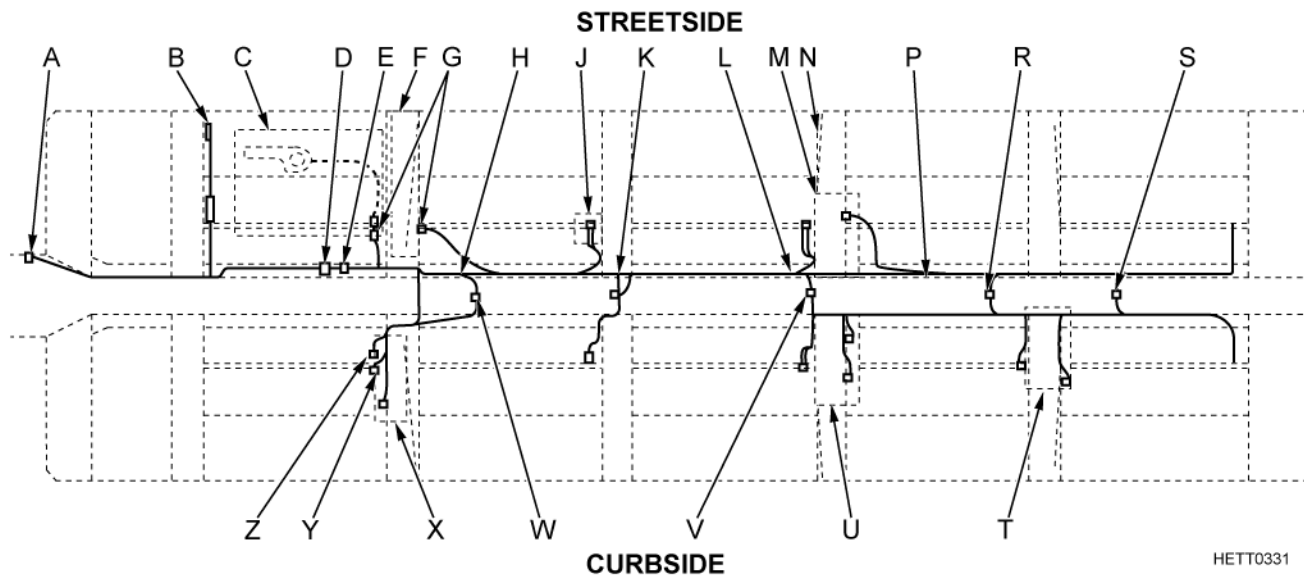
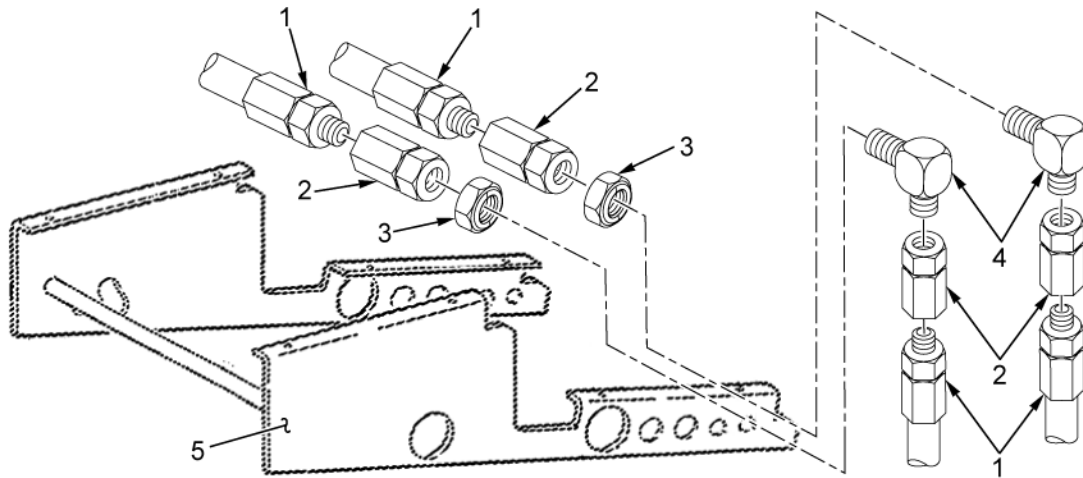


Figure 1. Bottom of Platform Looking Up, Guide Location for All Graphs.

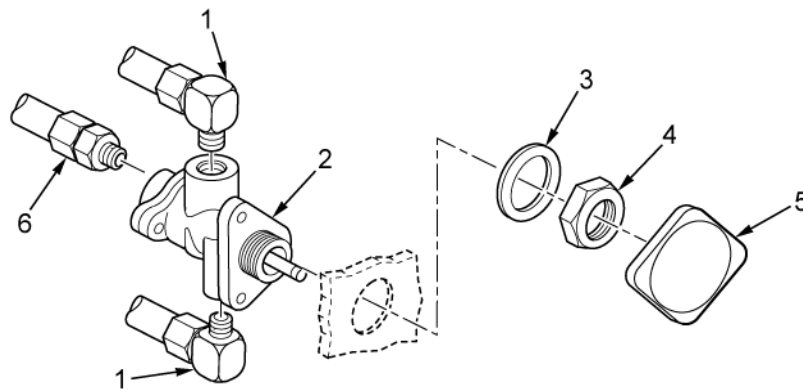
1. Tag and disconnect four straight pipe-to-tube adapters (Figure 2, Item 1) and straight pipe-to-hose adapters (Figure 2, Item 2) from two tube elbows (Figure 2, Item 4). Install caps/plugs into openings.
2. Remove two tube locknuts (Figure 2, Item 3) and tube elbows (Figure 2, Item 4) from platform weldment (Figure 2, Item 5). Install caps/plugs into openings.



HETT0332

Figure 2. Location A, Hose and Tube Adapters.

3. Remove knob (Figure 3, Item 5) from brake valve (Figure 3, Item 2). Remove nut (Figure 3, Item 4) and washer (Figure 3, Item 3) securing brake valve and remove brake valve from platform.
4. Remove two pipe-to-tube elbows (Figure 3, Item 1) and straight pipe-to-tube adapter (Figure 3, Item 6) from brake valve (Figure 3, Item 2). Install caps/plugs into openings.



HETT0333

Figure 3. Location B, Brake Valve from Platform.

5. Use 15/16 in. deepwell socket to remove two nuts (Figure 4, Item 7) and washers (Figure 4, Item 8) from brake chamber assembly (Figure 4, Item 14).
6. Remove cotter pin (Figure 4, Item 10), two flat washers (Figure 4, Item 9), and headless pin (Figure 4, Item 11) from rod end clevis (Figure 4, Item 12). Discard cotter pin.
7. Remove two nonmetallic channels (Figure 4, Item 3) and hose clamps (Figure 4, Item 4) from nonmetallic hoses (Figure 4, Item 5). Tag and disconnect two nonmetallic hoses from elbow fittings (Figure 4, Item 6). Install caps/plugs into openings.
8. Remove two elbow fittings (Figure 4, Item 6) from brake chamber assembly (Figure 4, Item 14). Install caps/plugs into openings.
9. Remove brake chamber assembly (Figure 4, Item 14) from axle. Remove screw (Figure 4, Item 2) and seal plug (Figure 4, Item 1) from brake chamber assembly.
10. Count and record number of turns to remove rod end clevis (Figure 4, Item 12). Unscrew and remove rod end clevis and nut (Figure 4, Item 13) from brake chamber assembly (Figure 4, Item 14).

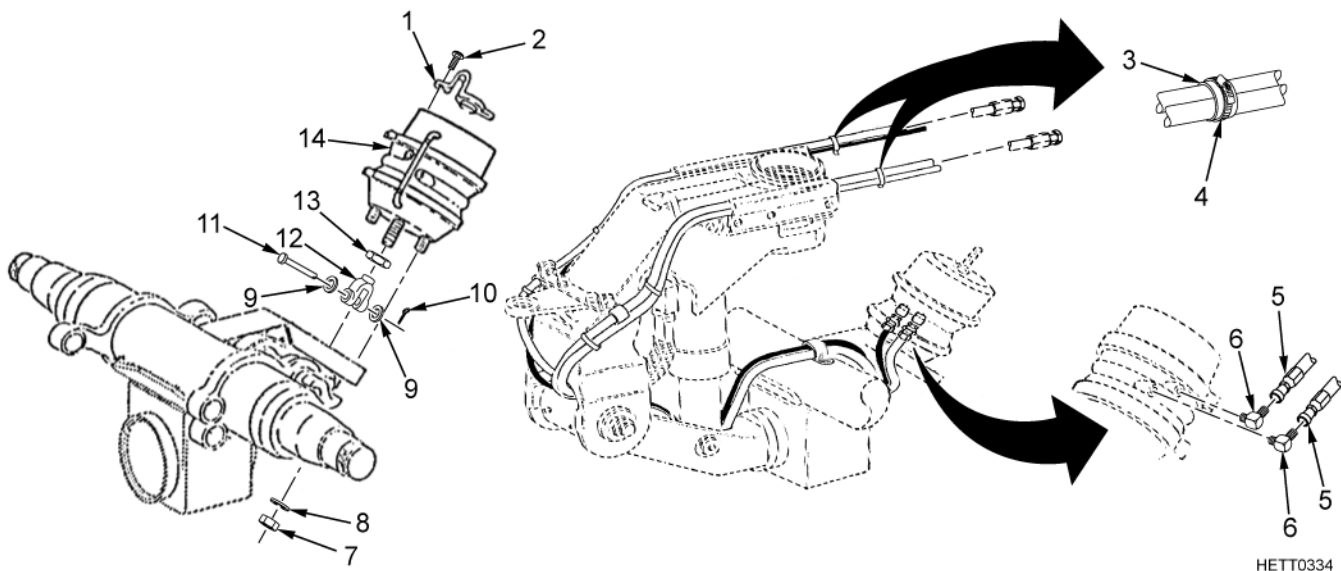
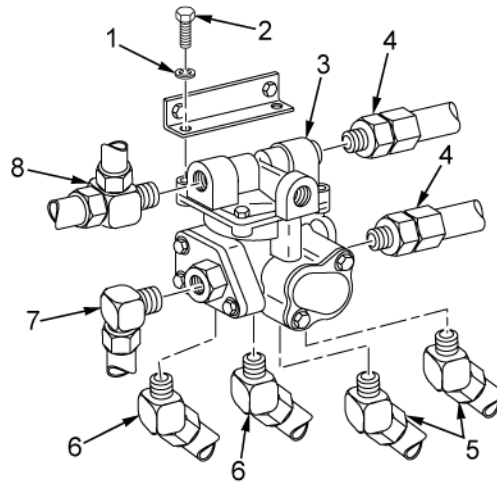


Figure 4. Location C, Brake Chamber Assembly, Typical 10 Places.

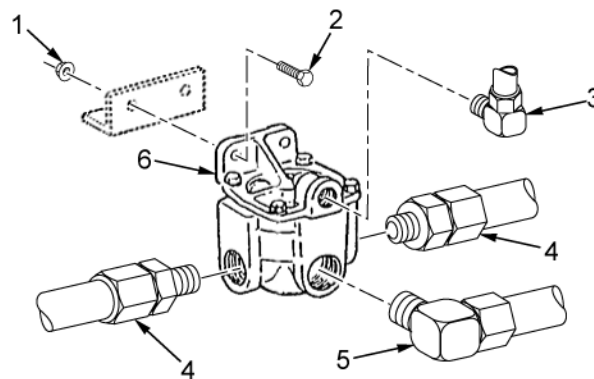
11. Remove pipe-to-tube tee (Figure 5, Item 8), two straight pipe-to-tube adapters (Figure 5, Item 4), three pipe-to-tube elbows (Figure 5, Item 6 and Item 7), and two pipe-to-tube elbows (Figure 5, Item 5) from air pressure relay (multifunction) valve (Figure 5, Item 3). Install caps/plugs into openings.
12. Remove two screws (Figure 5, Item 2), lockwashers (Figure 5, Item 1), and air pressure relay (multifunction) valve (Figure 5, Item 3) from platform weldment. Discard lockwashers.



HETT0335

Figure 5. (Location D) Pipe-to-Tube Tee, Adapter, and Elbows.

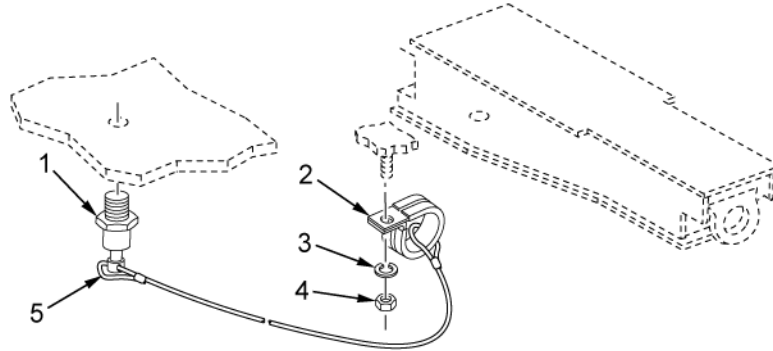
13. Remove two straight pipe-to-tube adapters (Figure 6, Item 4) and two pipe-to-tube elbows (Figure 6, Item 3 and Item 5) from air pressure relay valve (Figure 6, Item 6). Install caps/plugs into openings.
14. Remove two locknuts (Figure 6, Item 1) and screws (Figure 6, Item 2) from air pressure relay valve (Figure 6, Item 6) and remove from platform weldment. Discard two locknuts.



HETT0336

Figure 6. Location E, Air Pressure Relay Valve.

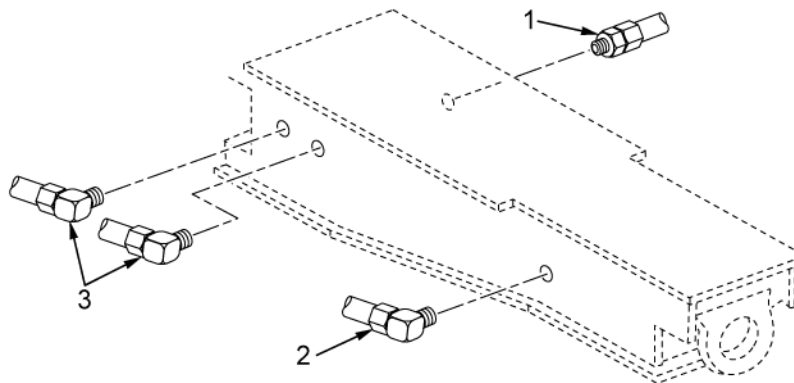
15. Remove nut (Figure 7, Item 4), lockwasher (Figure 7, Item 3), and loop clamp (Figure 7, Item 2) from weld stud. Discard lockwasher.
16. Open loop clamp (Figure 7, Item 2) and remove lanyard (Figure 7, Item 5). Unscrew and remove drain cock (Figure 7, Item 1) and lanyard from platform (air tank) weldment. Install plug into opening.



HETT0337

Figure 7. Location F, Air Pressure Relay Valve, Typical 5 Places.

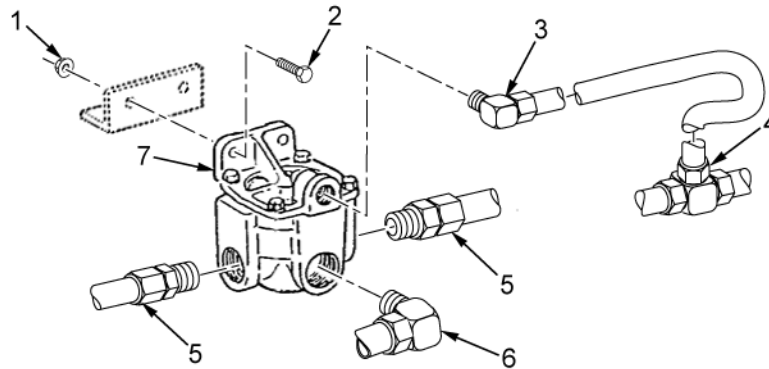
17. Remove three pipe-to-tube elbows (Figure 8, Item 3 and Item 2) and straight pipe-to-tube adapter (Figure 8, Item 1) from platform (air tank) weldment. Install caps/plugs into openings.



HETT0338

Figure 8. Location G, Platform Air Tank.

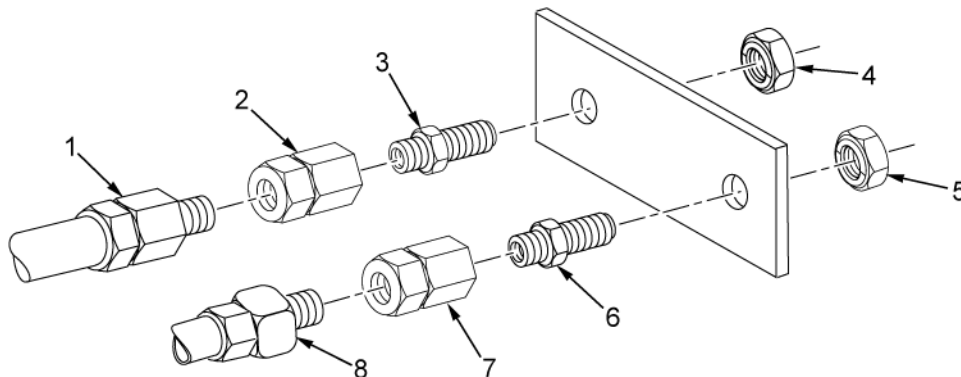
18. Remove two straight pipe-to-tube adapters (Figure 9, Item 5) and two pipe-to-tube elbows (Figure 9, Item 6 and Item 3) from air pressure relay valve (Figure 9, Item 7). Remove tube tee (Figure 9, Item 4) from platform weldment. Install caps/plugs into openings.
19. Remove two locknuts (Figure 9, Item 1) and screws (Figure 9, Item 2) from air pressure relay valve (Figure 9, Item 7) and remove from platform weldment. Discard two locknuts.



HETT0339

Figure 9. Location H, Adapters and Elbows from Air Pressure Relay Valve.

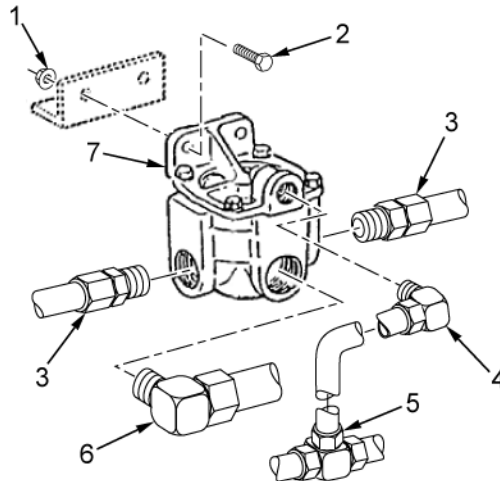
20. Remove straight pipe-to-tube adapters (Figure 10, Item 1 and Item 8) and two straight pipe-to-hose adapters (Figure 10, Item 2 and Item 7) from tube nipples (Figure 10, Item 3 and Item 6). Remove two tube locknuts (Figure 10, Item 4 and Item 5) and two tube nipples from platform weldment. Install caps/plugs into openings.



HETT0340

Figure 10. Location J, Adapters from Platform Weldment, Typical 10 Places.

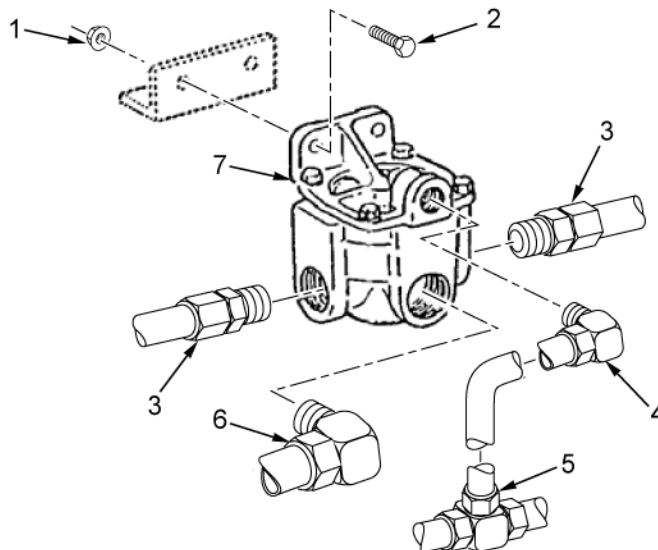
21. Remove two straight pipe-to-tube adapters (Figure 11, Item 3) and two pipe-to-tube elbows (Figure 11, Item 6 and Item 4) from air pressure relay valve (Figure 11, Item 7). Remove pipe-to-tube tee (Figure 11, Item 5) from platform weldment. Install caps/plugs into openings.
22. Remove two locknuts (Figure 11, Item 1) and screws (Figure 11, Item 2) from air pressure relay valve (Figure 11, Item 7) and remove air pressure relay valve from platform weldment. Discard two locknuts.



HETT0341

Figure 11. Location K, Air Pressure Relay Valve.

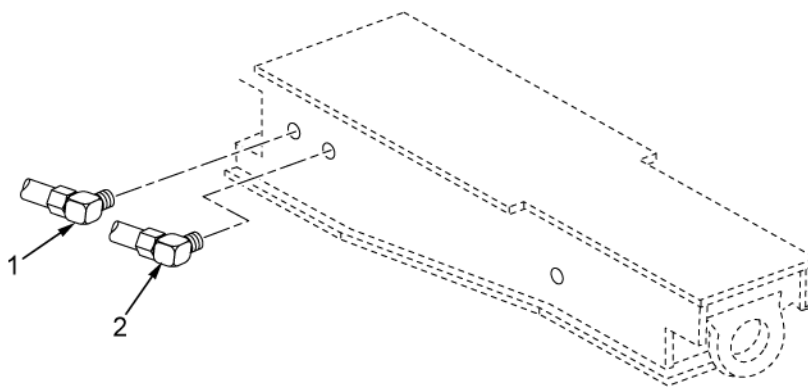
23. Remove two straight pipe-to-tube adapters (Figure 12, Item 3) and two pipe-to-tube elbows (Figure 12, Item 6 and Item 4) from air pressure relay valve (Figure 12, Item 7). Remove pipe-to-tube tee (Figure 12, Item 5) from platform weldment. Install caps/plugs into openings
24. Remove two locknuts (Figure 12, Item 1) and screws (Figure 12, Item 2) from air pressure relay valve (Figure 12, Item 7) and remove air pressure relay valve from platform weldment. Discard two locknuts.



HETT0342

Figure 12. Location L, Air Pressure Relay Valve.

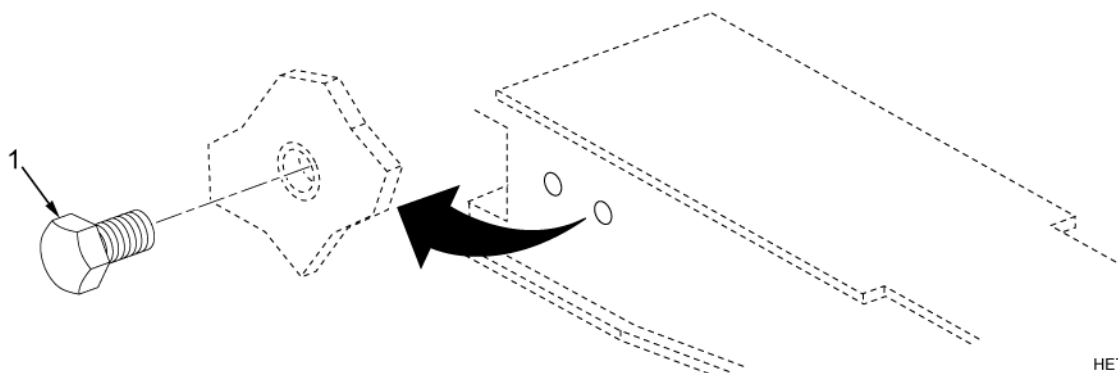
25. Remove two pipe-to-tube elbows (Figure 13, Item 1 and Item 2) from platform (air tank) weldment. Install caps/plugs into openings.



HETT0343

Figure 13. Location M, Elbow Removal.

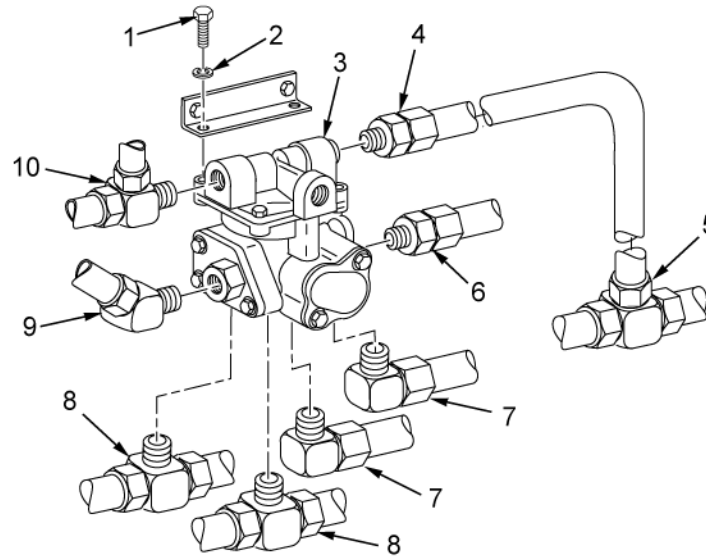
26. Remove pipe plug (Figure 14, Item 1) from platform weldment. Install plugs.



HETT0344

Figure 14. Location N, Pipe Plug Removal, Typical 18 Places.

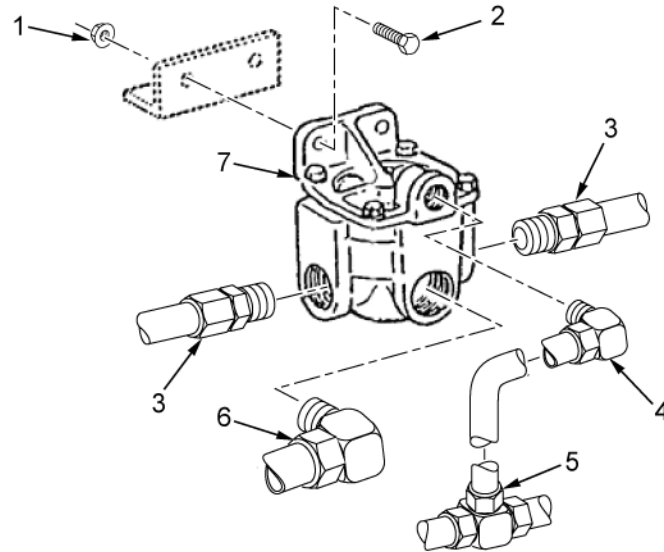
27. Remove three pipe-to-tube tees (Figure 15, Item 10 and Item 8), two straight pipe-to-tube adapters (Figure 15, Item 4 and Item 6), and three pipe-to-tube elbows (Figure 15, Item 7 and Item 9) from air pressure relay (multifunction) valve (Figure 15, Item 3). Remove pipe-to-tube tee (Figure 15, Item 5) from air pressure relay (multifunction) valve. Install caps/plugs into openings.
28. Remove two screws (Figure 15, Item 1), lockwashers (Figure 15, Item 2), and air pressure relay (multifunction) valve (Figure 15, Item 3) from platform weldment. Discard lockwashers.



HETT0345

Figure 15. Location P, Tees, Adapters, and Elbows Removal.

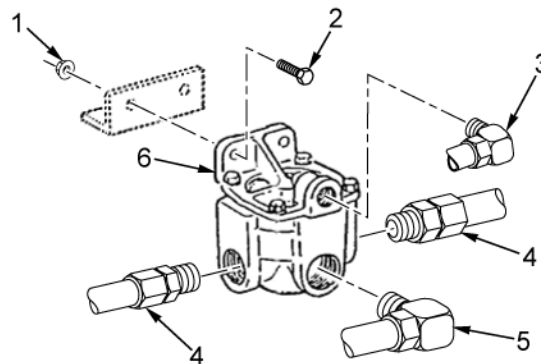
29. Remove two straight pipe-to-tube adapters (Figure 16, Item 3) and pipe-to-tube elbows (Figure 16, Item 4 and Item 6) from air pressure relay valve (Figure 16, Item 7). Remove pipe-to-tube tee (Figure 16, Item 5) from pipe-to-tube elbow. Install caps/plugs into openings.
30. Remove two locknuts (Figure 16, Item 1) and screws (Figure 16, Item 2) from air pressure relay valve (Figure 16, Item 7) and remove air pressure relay valve from platform weldment. Discard two locknuts.



HETT0346

Figure 16. Location R, Adapters and Elbows from Air Pressure Relay Valve Removal.

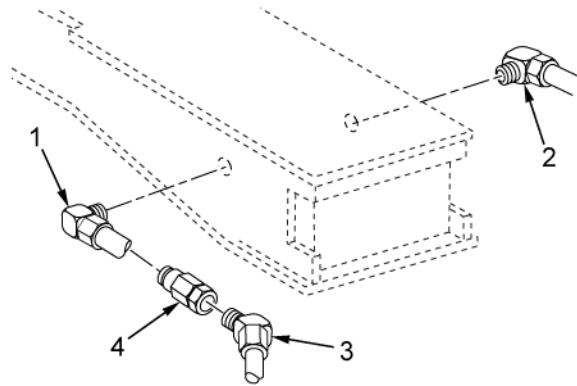
31. Remove two straight pipe-to-tube adapters (Figure 17, Item 4) and pipe-to-tube elbows (Figure 17, Item 3 and Item 5) from air pressure relay valve (Figure 17, Item 6). Install caps/plugs into openings.
32. Remove two locknuts (Figure 17, Item 1) and screws (Figure 17, Item 2) from air pressure relay valve (Figure 17, Item 6) and remove air pressure relay valve from platform weldment. Discard two locknuts.



HETT0347

Figure 17. Location S, Adapters and Elbows from Air Pressure Relay Valve Removal.

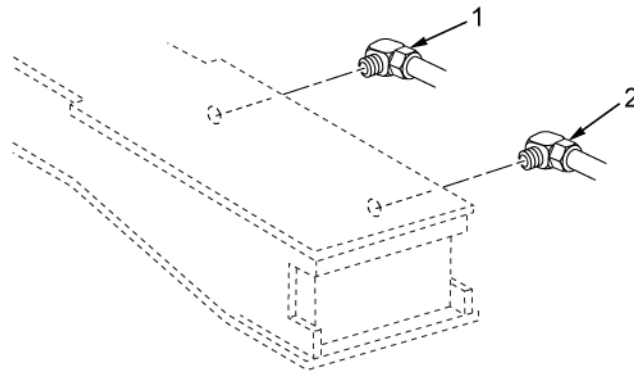
33. Remove pipe-to-tube elbow (Figure 18, Item 3) from check valve (Figure 18, Item 4). Remove check valve, pipe elbow (Figure 18, Item 1), and pipe-to-tube elbow (Figure 18, Item 2) from platform (air tank) weldment. Install caps/plugs into openings.



HETT0348

Figure 18. Location T, Elbow from Check Valve and from Weldment Removal.

34. Remove two pipe-to-tube elbows (Figure 19, Item 1 and Item 2) from platform (air tank) weldment. Install caps/plugs into openings.



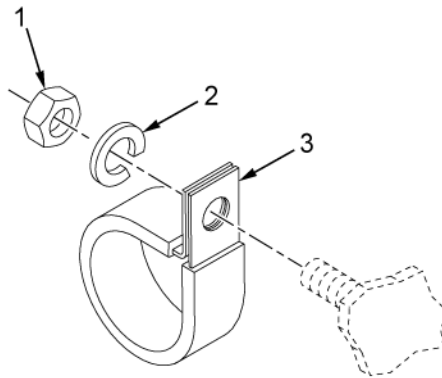
HETT0349

Figure 19. Location U, Elbow from Weldment Removal.

NOTE

There may be one or more loop clamps stacked onto one weld stud. Note the orientation of the clamps prior to removal so that all clamps can be properly reinstalled.

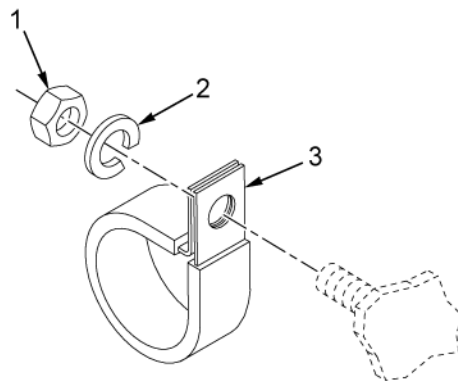
35. Remove nut (Figure 20, Item 1), lockwasher (Figure 20, Item 2), and loop clamp (Figure 20, Item 3) from weld stud. Discard lockwasher.



HETT0350

Figure 20. Location V, Loop Clamp from Weld Stud Removal.

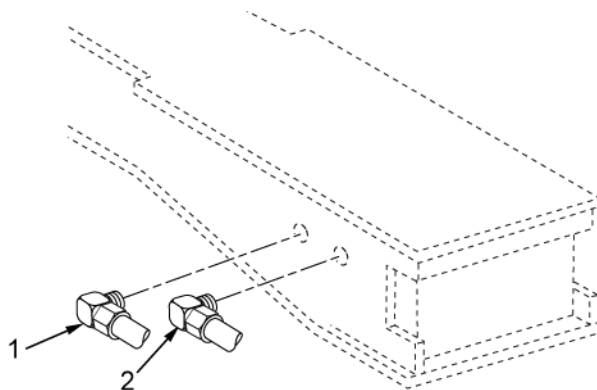
36. Remove six nuts (Figure 21, Item 1), lockwashers (Figure 21, Item 2), and loop clamps (Figure 21, Item 3) from weld studs. Discard lockwashers.



HETT0351

Figure 21. Location W, Loop Clamp from Weld Stud Removal, Typical 6 Places.

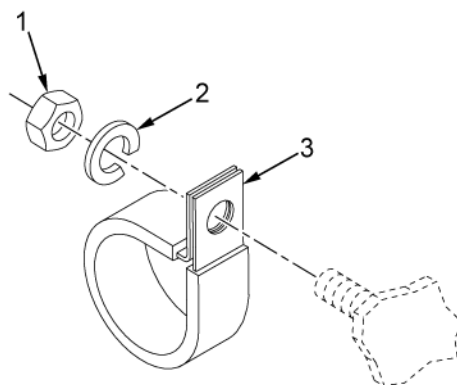
37. Remove two pipe-to-tube elbows (Figure 22, Item 1 and Item 2) from platform (air tank) weldment. Install caps/plugs into openings.



HETT0352

Figure 22. Location X, Elbows from Weldment Removal.

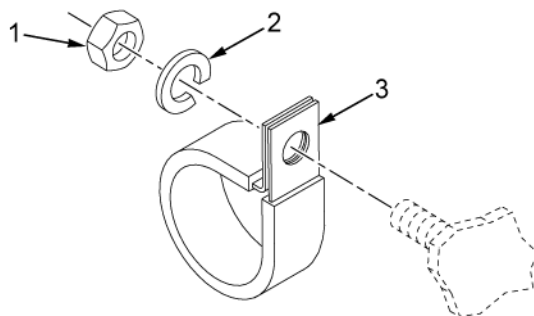
38. Remove four nuts (Figure 23, Item 1), lockwashers (Figure 23, Item 2), and loop clamps (Figure 23, Item 3) from weld studs. Discard lockwashers.



HETT0353

Figure 23. Location Y, Loop Clamp from Weld Stud Removal, Typical 4 Places.

39. Remove two nuts (Figure 24, Item 1), lockwashers (Figure 24, Item 2), and loop clamps (Figure 24, Item 3) from weld studs. Discard lockwashers.



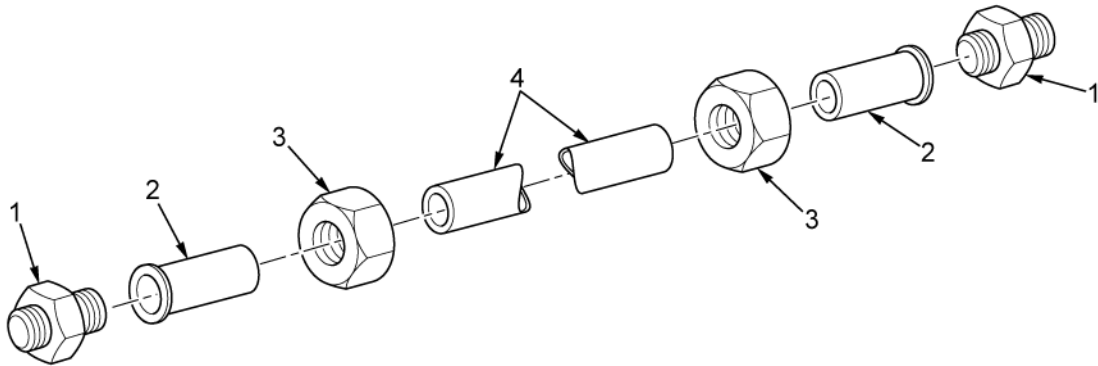
HETT0354

Figure 24. Location Z, Loop Clamp from Weld Stud Removal, Typical 2 Places.

END OF TASK

REPAIR

1. Inspect nonmetallic hoses removed for kinks, splits, deterioration, chafing, cuts, and loose fittings. If any nonmetallic hoses are defective, repair hoses and replace fittings as required.
2. Inspect air pressure relay valves, air pressure relay (multifunction) valves, drain cocks, and air brake valves for air leaks, broken housings, cracked or stripped threads, and corrosion. Clean corroded parts as required. Replace defective parts as required.
3. Obtain new fittings and bulk nonmetallic hose.
4. Refer to WP 0164 and cut new nonmetallic hose (Figure 25, Item 4) to specified length.
5. Install fitting nut (Figure 25, Item 3), small opening first, onto nonmetallic hose (Figure 25, Item 4). Install sleeve fitting (Figure 25, Item 2) onto end of nonmetallic hose.
6. Push adapter fitting (Figure 25, Item 1) over sleeve fitting (Figure 25, Item 2) and nonmetallic hose (Figure 25, Item 4) as far as possible by hand and tighten fitting nut (Figure 25, Item 3) to adapter fitting.
7. Install caps and plugs on manufactured hose until ready for installation.
8. Repeat steps 5 through 7 to install fitting onto other end of nonmetallic hose (Figure 25, Item 4).



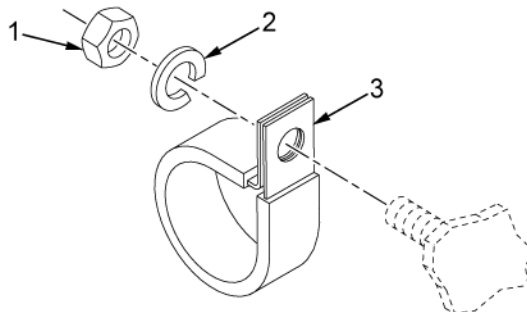
HETT0355

Figure 25. Adapter Fittings.

END OF TASK

INSTALLATION

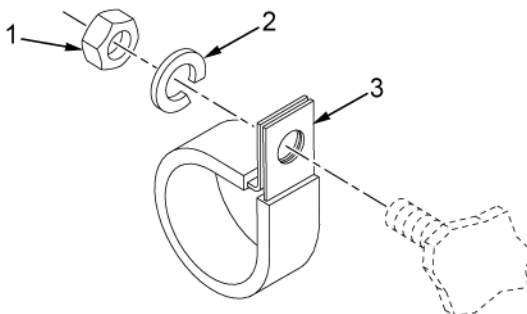
1. Align and install two loop clamps (Figure 26, Item 3) onto weld studs and secure with two lockwashers (Figure 26, Item 2) and nuts (Figure 26, Item 1).



HETT0357

Figure 26. Location Z, Loop Clamp to Weld Stud Installation, Typical 2 Places.

2. Align and install four loop clamps (Figure 27, Item 3) onto weld studs and secure with four lockwashers (Figure 27, Item 2) and nuts (Figure 27, Item 1).



HETT0358

Figure 27. Location Y, Loop Clamp to Weld Stud Installation, Typical 4 Places.

WARNING

- Adhesives, solvents, and sealing compounds may burn easily, may give off harmful vapors, and are harmful to skin and clothing. Keep away from open flames and use in well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.
- On direct contact, uncured silicone sealant irritates eyes. In case of contact, flush eyes with water and seek medical attention. In case of skin contact, wipe off and flush with water.

Failure to follow these warnings may result in injury or death to personnel.

CAUTION

- Apply pipe sealant compound to all male pipe threads of pneumatic fittings, using only enough compound to coat the threads. **DO NOT** allow compound to enter a component/fitting or the compound may restrict/block air passages and damage to equipment or equipment failure may result.
 - Note positioning/orientation of fittings on the illustrations. It is important to have the tightened fittings positioned as shown so that hoses are not too short and fittings do not interfere with one another or damage to equipment may result.
3. Apply pipe sealant compound to male threads of fittings. Remove caps/plugs and install two pipe-to-tube elbows (Figure 28, Item 2 and Item 1) to platform (air tank) weldment.

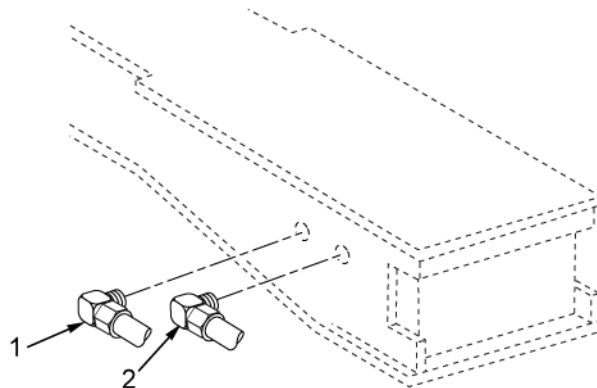
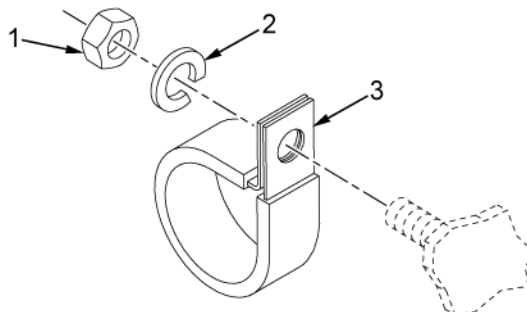


Figure 28. Location X, Sealant to Threads Installation.

HETT0361

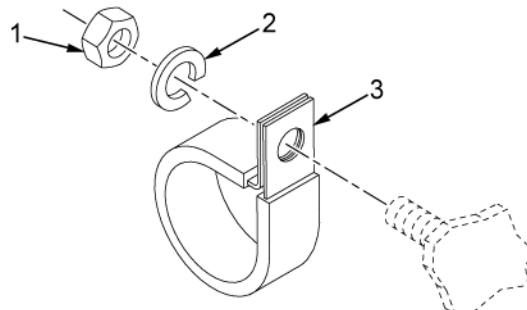
4. Align and install two loop clamps (Figure 29, Item 3) onto weld studs and secure with two lockwashers (Figure 29, Item 2) and nuts (Figure 29 , Item 1).



HETT0360

Figure 29. Location W, Loop Clamp to Weld Stud Installation, Typical 6 Places.

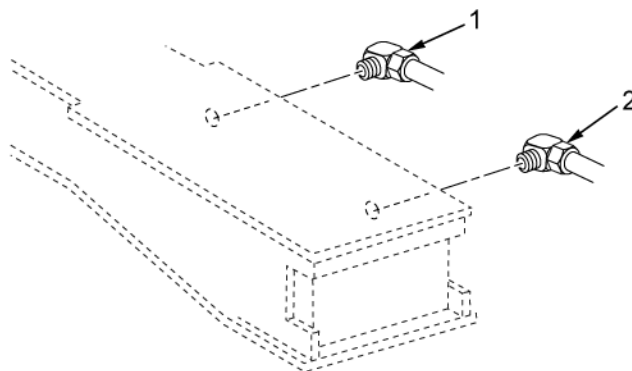
5. Align and install two loop clamps (Figure 30, Item 3) onto weld studs and secure with two lockwashers (Figure 30, Item 2) and nuts (Figure 30, Item 1).



HETT0359

Figure 30. Location V, Loop Clamp to Weld Stud Installation, Typical 2 Places.

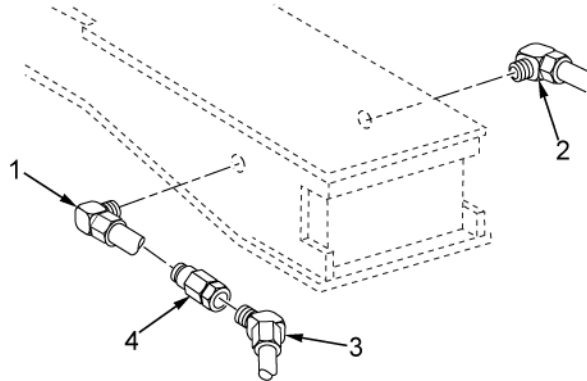
6. Apply pipe sealant compound to male threads of fittings. Remove caps/plugs from two pipe-to-tube elbows (Figure 31, Item 2 and Item 1) and install two pipe-to-tube elbows to platform (air tank) weldment.



HETT0363

Figure 31. Location U, Pipe Sealant Compound to Male Threads Installation.

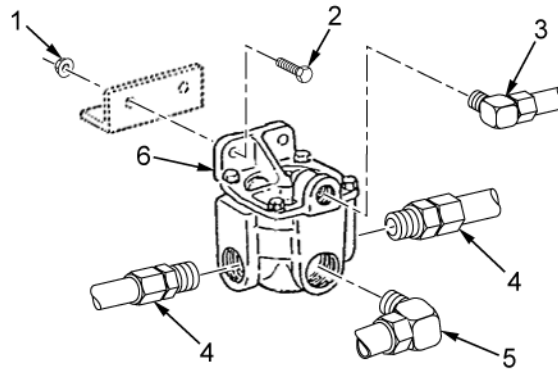
7. Apply pipe sealant compound to male threads of fittings. Remove caps/plugs from pipe-to-tube elbow (Figure 32, Item 2), pipe elbow (Figure 32, Item 1), check valve (Figure 32, Item 4), and pipe-to-tube elbow (Figure 32, Item 3) and install pipe-to-tube elbow, pipe elbow, check valve, and pipe-to-tube elbow to platform (air tank) weldment.



HETT0362

Figure 32. Location T, Pipe Sealant Compound to Male Threads Installation.

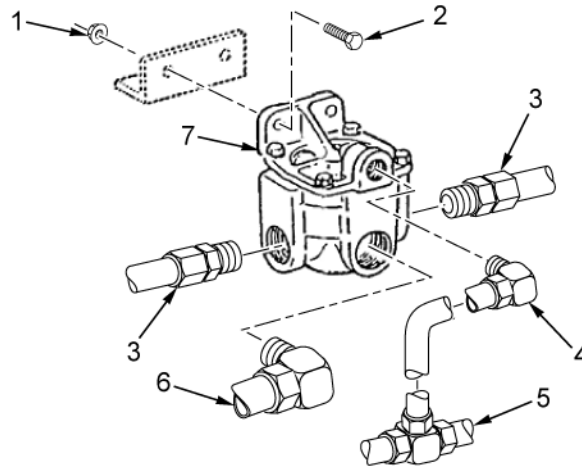
8. Apply pipe sealant compound to male threads of fittings. Remove caps/plugs from two pipe-to-tube elbows (Figure 33, Item 5 and Item 3) and two straight pipe-to-tube adapters (Figure 33, Item 4) and install two pipe-to-tube elbows and two straight pipe-to-tube elbows to air pressure relay valve (Figure 33, Item 6).
9. Install air pressure relay valve (Figure 33, Item 6) to platform weldment and secure with two screws (Figure 33, Item 2) and locknuts (Figure 33, Item 1).



HETT0365

Figure 33. Location S, Pipe Sealant Compound to Male Threads Installation.

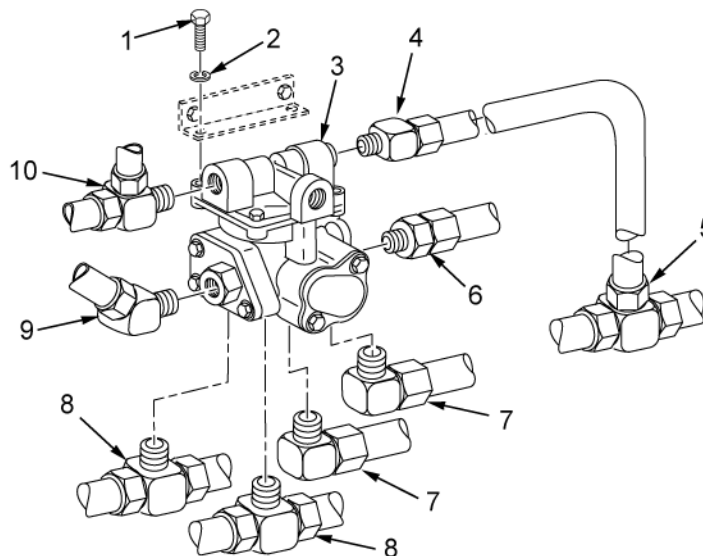
10. Apply pipe sealant compound to male threads of fittings. Remove caps/plugs from two pipe-to-tube elbows (Figure 34, Item 6 and Item 4) and two straight pipe-to-tube adapters (Figure 34, Item 3), and install two pipe-to-tube elbows and two straight pipe-to-tube adapters to air pressure relay valve (Figure 34, Item 7).
11. Install air pressure relay valve (Figure 34, Item 7) to platform weldment and secure with two screws (Figure 34, Item 2) and locknuts (Figure 34, Item 1).
12. Apply pipe sealant compound to male threads of fittings. Remove caps/plugs and install tube tee (Figure 34, Item 5).



HETT0364

Figure 34. Location R, Pipe Sealant Compound to Male Threads Installation.

13. Apply pipe sealant compound to male threads of fittings. Remove caps/plugs and install three pipe-to-tube elbows (Figure 35, Item 9 and Item 7), two straight pipe-to-tube adapters (Figure 35, Item 6 and Item 4), and three pipe-to-tube tees (Figure 35, Item 8 and Item 10) to air pressure (multifunction) relay valve (Figure 35, Item 3).
14. Install air pressure (multifunction) relay valve (Figure 35, Item 3) to platform weldment and secure with two lockwashers (Figure 35, Item 2) and screws (Figure 35, Item 1). Use a torque wrench to torque screws to 50 to 70 in.-lb (5.5 to 8.0 Nm).
15. Apply pipe sealant compound to male threads of fittings. Remove caps/plugs and install tube tee (Figure 35, Item 5) to straight pipe-to-tube adapter (Figure 35, Item 4).



HETT0367

Figure 35. Location P, Pipe Sealant Compound to Male Threads Installation.

16. Apply pipe sealant compound to male threads of pipe plug. Remove plugs from pipe plug (Figure 36, Item 1) and install pipe plug to platform weldment.

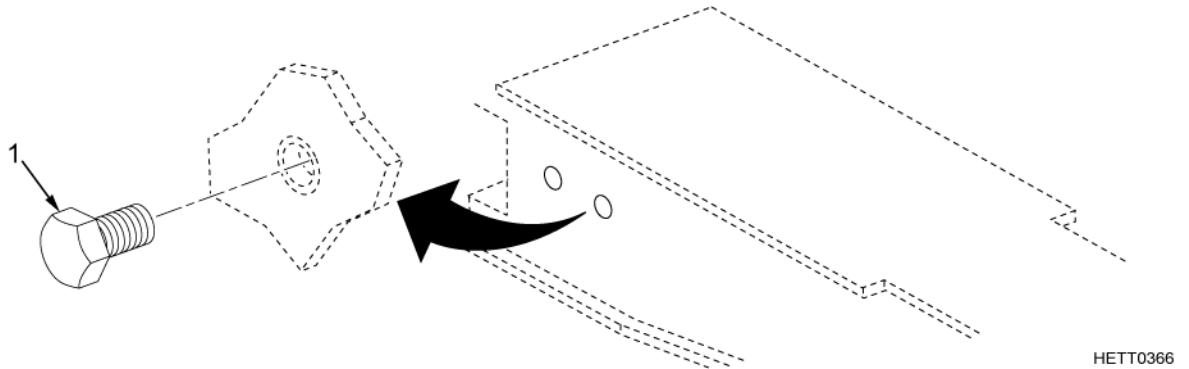


Figure 36. Location N, Pipe Sealant Compound to Male Threads Installation, Typical 18 Places.

17. Apply pipe sealant compound to male threads of fittings. Remove caps/plugs from two pipe-to-tube elbows (Figure 37, Item 2 and Item 1) and install pipe-to-tube elbows to platform (air tank) weldment.

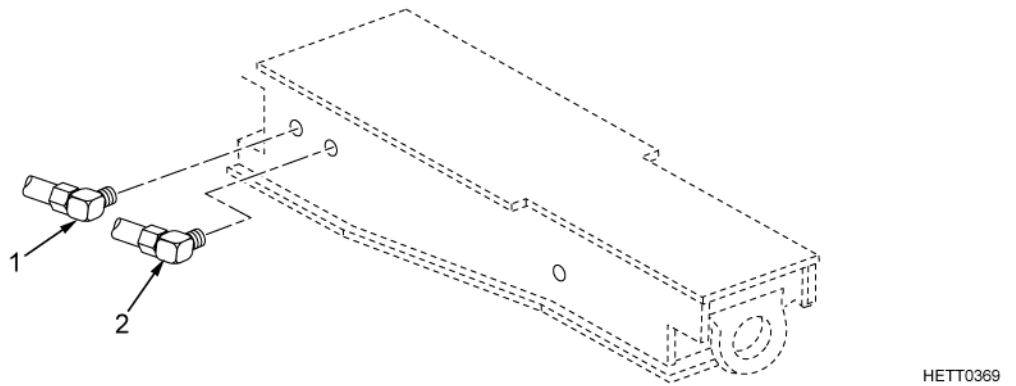
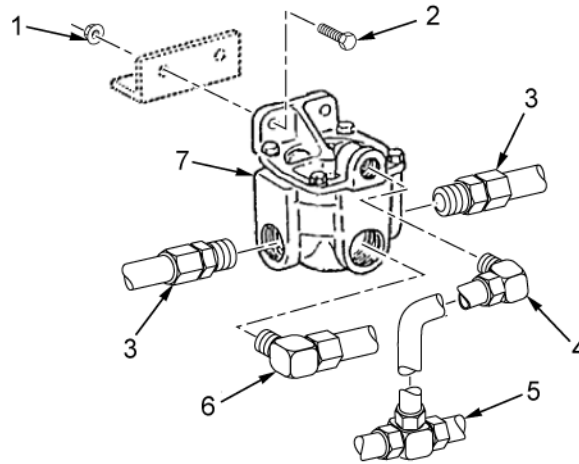


Figure 37. Location M, Pipe Sealant Compound to Male Threads Installation.

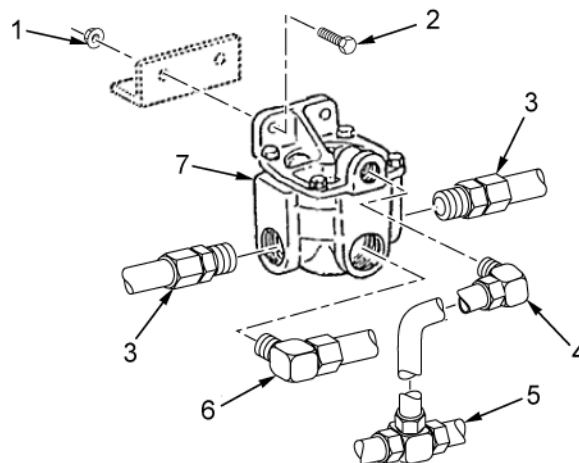
18. Apply pipe sealant compound to male threads of fittings. Remove caps/plugs from two pipe-to-tube elbows (Figure 38, Item 4 and Item 6) and two straight pipe-to-tube adapters (Figure 38, Item 3), and install two pipe-to-tube elbows and two straight pipe-to-tube adapters to air pressure relay valve (Figure 38, Item 7).
19. Install air pressure relay valve (Figure 38, Item 7) to platform weldment and secure with two screws (Figure 38, Item 2) and locknuts (Figure 38, Item 1).
20. Apply pipe sealant compound to male threads of fittings. Remove caps/plugs from pipe-to-tube tee (Figure 38, Item 5) and install pipe-to-tube tee to pipe-to-tube elbow (Figure 38, Item 4).



HETT0368

Figure 38. Location L, Pipe Sealant Compound to Male Threads Installation.

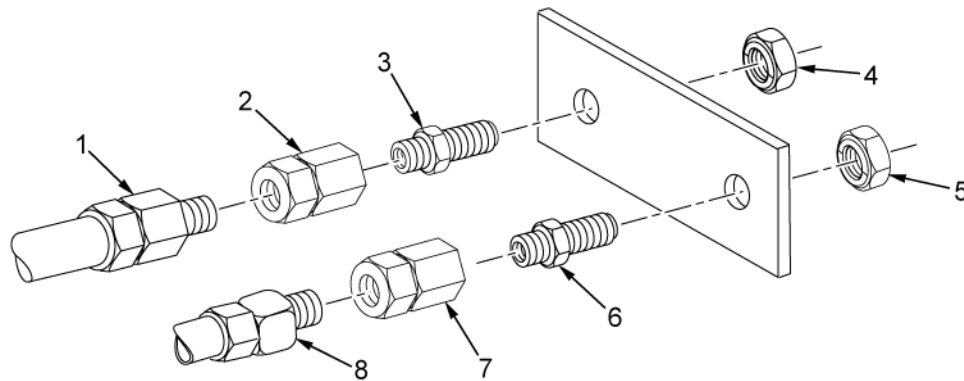
21. Apply pipe sealant compound to male threads of fittings. Remove caps/plugs from two pipe-to-tube elbows (Figure 39, Item 4 and Item 6) and two straight pipe-to-tube adapters (Figure 39, Item 3), and install two pipe-to-tube elbows and two straight pipe-to-tube adapters to air pressure relay valve (Figure 39, Item 7).
22. Install air pressure relay valve (Figure 39, Item 7) to platform weldment and secure with two screws (Figure 39, Item 2) and locknuts (Figure 39, Item 1).
23. Apply pipe sealant compound to male threads of fittings. Remove caps/plugs from pipe-to-tube tee (Figure 39, Item 5) and install to pipe-to-tube elbow (Figure 39, Item 4).



HETT0370

Figure 39. Location K, Pipe Sealant Compound to Male Threads Installation.

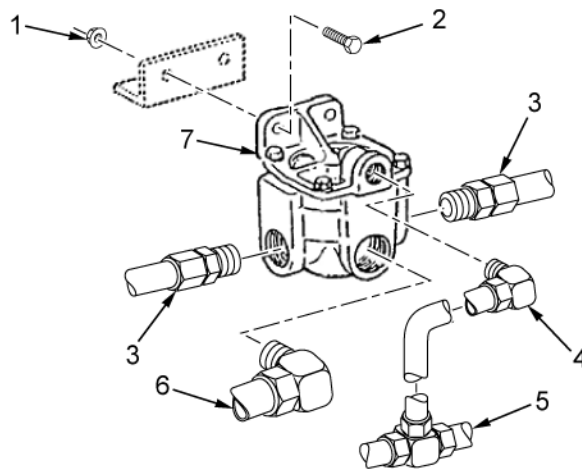
24. Install two tube nipples (Figure 40, Item 6 and Item 3) to platform weldment and secure with two tube locknuts (Figure 40, Item 4 and Item 5).
25. Apply pipe sealant compound to male threads of fittings and install two straight pipe-to-hose adapters (Figure 40, Item 7 and Item 2) and straight pipe-to-tube adapters (Figure 40, Item 8 and Item 1) to two tube nipples (Figure 40, Item 6 and Item 3).



HETT0371

Figure 40. Location J, Tube Nipples Installation, 10 Places.

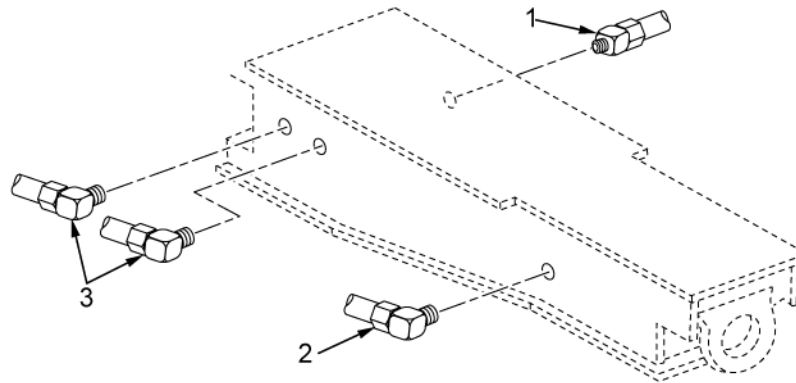
26. Apply pipe sealant compound to male threads of fittings. Remove caps/plugs from two pipe-to-tube elbows (Figure 41, Item 4 and Item 6) and two straight pipe-to-tube adapters (Figure 41, Item 3), and install two pipe-to-tube elbows and two straight pipe-to-tube adapters to air pressure relay valve (Figure 41, Item 7).
27. Install air pressure relay valve (Figure 41, Item 7) to platform weldment and secure with two screws (Figure 41, Item 2) and locknuts (Figure 41, Item 1).
28. Apply pipe sealant compound to male threads of fittings. Remove caps/plugs from tube tee (Figure 41, Item 5) and install to pipe-to-tube elbow (Figure 41, Item 4).



HETT0373

Figure 41. Location H, Pipe Sealant Compound to Male Threads Installation.

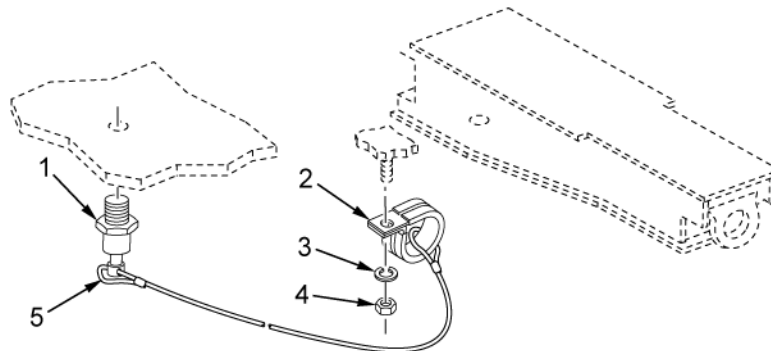
29. Apply pipe sealant compound to male threads of fittings. Install straight pipe-to-tube adapter (Figure 42, Item 1) and three pipe-to-tube elbows (Figure 42, Item 2 and Item 3) to platform (air tank) weldment.



HETT0372

Figure 42. Location G, Pipe Sealant Compound to Male Threads Installation.

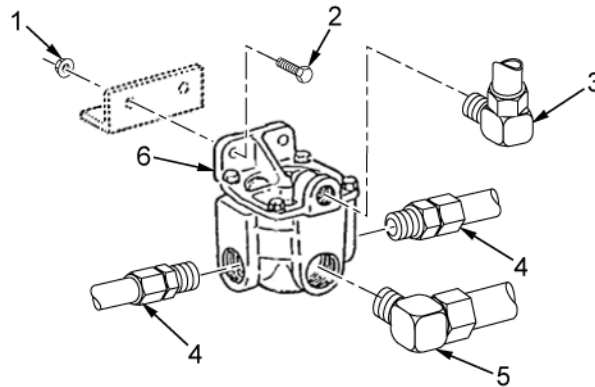
30. Apply pipe sealant compound to male threads of drain cock and install drain cock (Figure 43, Item 1) to platform (air tank) weldment. Open loop clamp (Figure 43, Item 2) and place loop end of lanyard (Figure 43, Item 5) for drain cock into loop clamp.
31. Align and install loop clamp (Figure 43, Item 2) to weld stud and secure with lockwasher (Figure 43, Item 3) and nut (Figure 43, Item 4).



HETT0337

Figure 43. Location F, Pipe Sealant Compound to Male Threads Installation, Typical 5 Places.

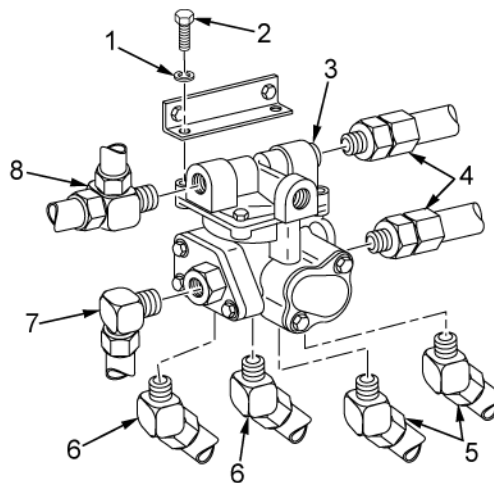
32. Apply pipe sealant compound to male threads of fittings. Remove caps/plugs from two pipe-to-tube elbows (Figure 44, Item 5 and Item 3) and two straight pipe-to-tube adapters (Figure 44, Item 4), and install elbows and adapters to air pressure relay valve (Figure 44, Item 6).
33. Install air pressure relay valve (Figure 44, Item 6) to platform weldment and secure with two screws (Figure 44, Item 2) and locknuts (Figure 44, Item 1).



HETT0376

Figure 44. Location E, Pipe Sealant Compound to Male Threads Installation.

34. Apply pipe sealant compound to male threads of fittings. Remove caps/plugs from two pipe-to-tube elbows (Figure 45, Item 5), three pipe-to-tube elbows (Figure 45, Item 7 and Item 6), two straight pipe-to-tube adapters (Figure 45, Item 4), and pipe-to-tube tee (Figure 45, Item 8). Install elbows, adapters, and tee to air pressure (multifunction) relay valve (Figure 45, Item 3).
35. Install air pressure (multifunction) relay valve (Figure 45, Item 3) to platform weldment and secure with two screws (Figure 45, Item 2) and lockwashers (Figure 45, Item 1). Use torque wrench to torque screws to 50 to 75 in.-lb (5.5 to 8.0 Nm).



HETT0375

Figure 45. Location D, Pipe Sealant Compound to Male Threads Installation.

36. Align and install nut (Figure 46, Item 13) and rod end clevis (Figure 46, Item 12) onto brake chamber assembly (Figure 46, Item 14). Install nut and clevis using the same number of turns recorded during removal.
37. Install seal plug (Figure 46, Item 1) and screw (Figure 46, Item 2) to brake chamber assembly (Figure 46, Item 14) and align and install brake chamber assembly onto axle.
38. Apply pipe sealant compound to male threads of fittings. Remove caps/plugs from two elbow fittings (Figure 46, Item 6) and install elbow fittings to brake chamber assembly (Figure 46, Item 14). Connect two nonmetallic hoses (Figure 46, Item 5) to elbow fittings.
39. Install two hose clamps (Figure 46, Item 4) and nonmetallic channels (Figure 46, Item 3) onto two nonmetallic hoses (Figure 46, Item 5).
40. Use 15/16 in. deepwell socket to secure brake chamber assembly (Figure 46, Item 14) to axle by installing two lockwashers (Figure 46, Item 8) and nuts (Figure 46, Item 7). Use a torque wrench to torque nuts to 80 to 125 lb-ft (108.5 to 169.5 Nm).
41. Align and install headless pin (Figure 46, Item 11), two flat washers (Figure 46, Item 9), and cotter pin (Figure 46, Item 10) to rod end clevis (Figure 46, Item 12).

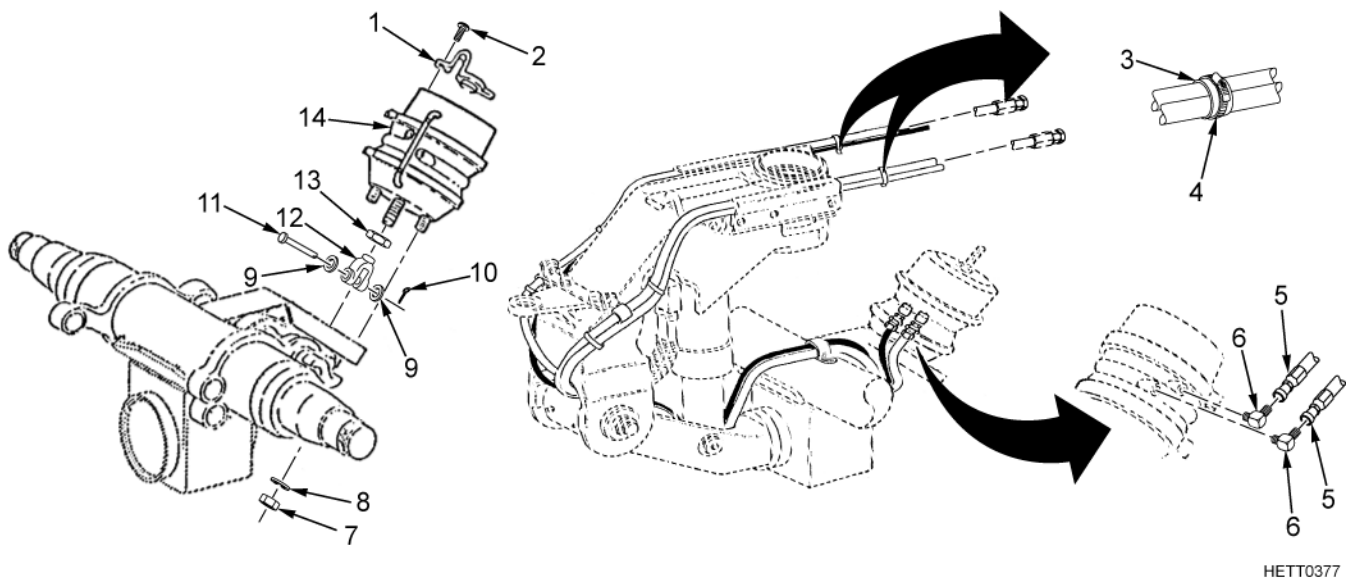
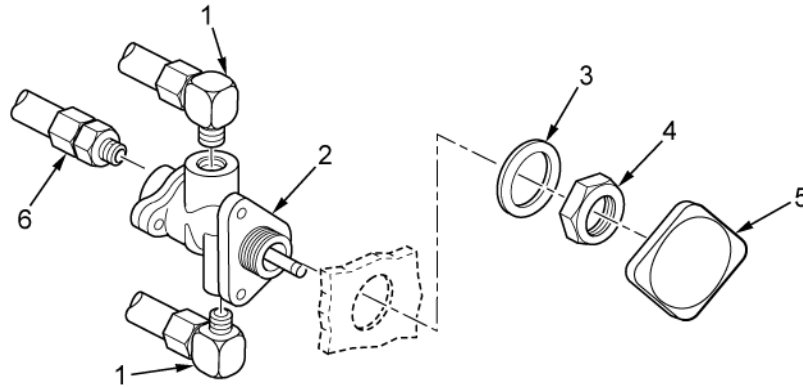


Figure 46. Location C, Brake Chamber Assembly, 10 Places.

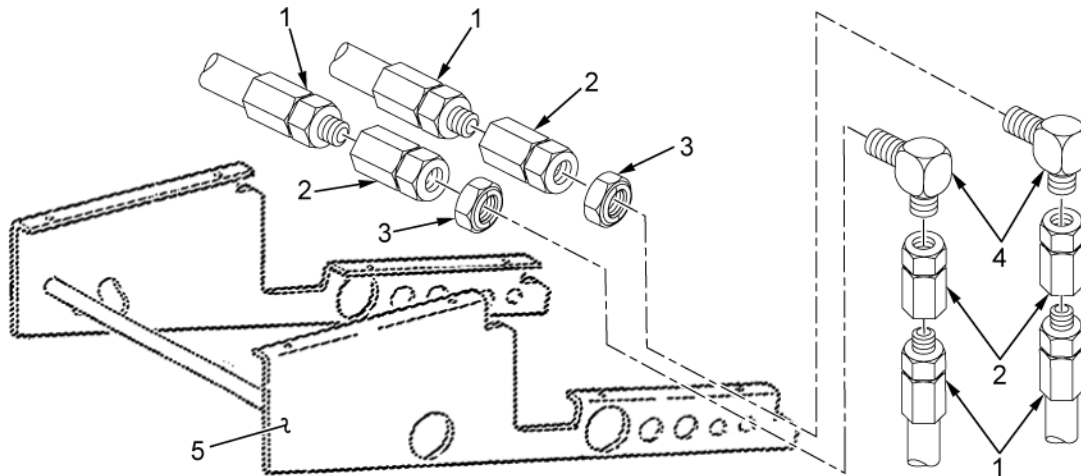
42. Apply pipe sealant compound to male threads of fittings. Remove caps/plugs from straight pipe-to-tube adapter (Figure 47, Item 6) and two pipe-to-tube elbows (Figure 47, Item 1), and install adapter and elbows to brake valve (Figure 47, Item 2).
43. Align and install brake valve (Figure 47, Item 2) to platform weldment and secure with washer (Figure 47, Item 3) and retainer nut (Figure 47, Item 4). Install knob (Figure 47, Item 5) onto brake valve.



HETT0333

Figure 47. Location B, Pipe Sealant Compound to Male Threads Installation.

44. Remove caps/plugs from two tube elbows (Figure 48, Item 4) and install elbows to platform weldment (Figure 48, Item 5). Secure tube elbows in place using fitting nuts (Figure 48, Item 3).
45. Apply pipe sealant compound to male threads of fittings. Remove caps/plugs from four straight pipe-to-hose adapters (Figure 48, Item 2) and straight pipe-to-tube adapters (Figure 48, Item 1), and install adapters onto two tube elbows (Figure 48, Item 4).



HETT0332

Figure 48. Location A, Elbows to Weldment Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Couple tractor/semitrailer, charge air system, and check for leaks (WP 0013).

Perform highway driving and check brake operations (WP 0014).

END OF WORK PACKAGE

FIELD MAINTENANCE

HUB AND DRUM

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Lockwasher (6)

Personnel Required

2

Materials/Parts

Grease (WP 0170, Item 16)
Solvent, Cleaning Compound (WP 0170, Item 31)
Rear Hub Oil Seal (1)
Gasket (1)

Equipment Conditions

Wheels removed from affected bogie (WP 0078 and WP 0079) or (WP 0080 and WP 0081)
Brakes caged (WP 0023)

GENERAL INFORMATION

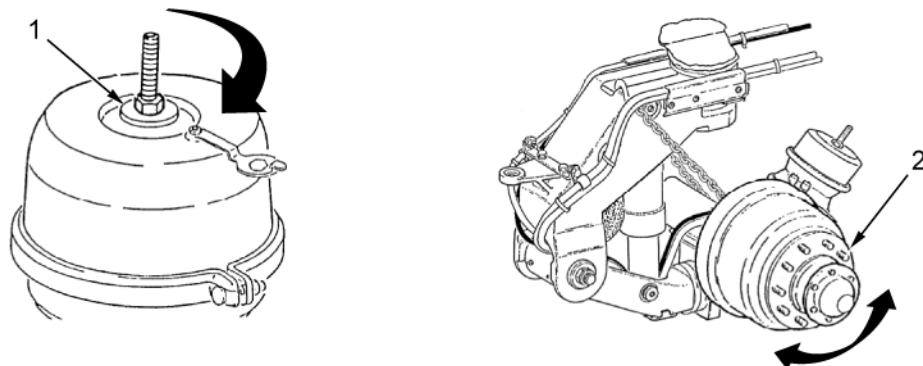
This work package contains instructions for removal, repair, and installation of the hub and drum.

REMOVAL

WARNING

When trailer has performed heavy braking, the brake drums should be HOT to the touch. Use caution and do not come in contact with the brake drum to check for heat. Allow brake drum to cool before performing maintenance. Failure to follow this warning may result in injury to personnel.

1. Rotate hub and drum assembly (Figure 1, Item 1) in both directions to ensure brakes are properly caged. If hub and drum assembly spins freely, brakes are properly caged.
2. If hub and drum assembly drags on brake shoes, turn nut (Figure 1, Item 2) clockwise until hub and drum assembly (Figure 1, Item 1) spins freely.



HETT0380

Figure 1. Cage Brake Check.

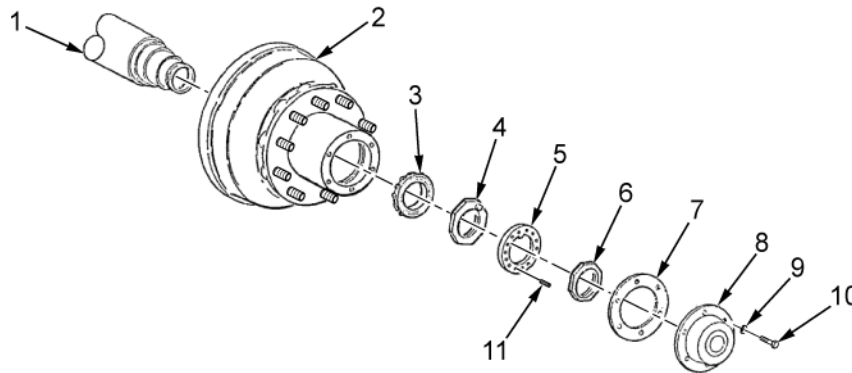
3. Remove six capscrews (Figure 2, Item 10), lockwashers (Figure 2, Item 9), wheel hub cap (Figure 2, Item 8), and gasket (Figure 2, Item 7) from hub and drum assembly (Figure 2, Item 2). Discard lockwashers and gasket.
4. Remove setscrew (Figure 2, Item 11) from lockwasher assembly (Figure 2, Item 5). Use 3/4 in. drive ratchet and 3-1/4 in. and 3-7/8 in. wheel bearing sockets to loosen and remove wheel bearing jamnut (Figure 2, Item 6), lockwasher assembly, and wheel bearing adjusting nut (Figure 2, Item 4) from axle (Figure 2, Item 1).

WARNING



When removing hub and drum assembly from the axle, two personnel are required. One person removes parts, and one person supports hub and drum assembly in place on the axle. Failure to follow this warning may result in injury to personnel.

5. Use two personnel to remove outer tapered roller bearing (Figure 2, Item 3) and hub and drum assembly (Figure 2, Item 2) from axle (Figure 2, Item 1).



HETT0381

Figure 2. Hub and Drum Assembly Removal.

END OF TASK

REPAIR

1. Remove plain encased seal (Figure 3, Item 1) and inner tapered roller bearing cone (Figure 3, Item 2) from hub and drum assembly (Figure 3, Item 4). Discard seal.
2. Drive out outer tapered roller bearing cup (Figure 3, Item 8) from inner axle side of hub and drum assembly (Figure 3, Item 4).
3. Drive out inner tapered roller bearing cup (Figure 3, Item 3) from wheel hub cap side of hub and drum assembly (Figure 3, Item 4).

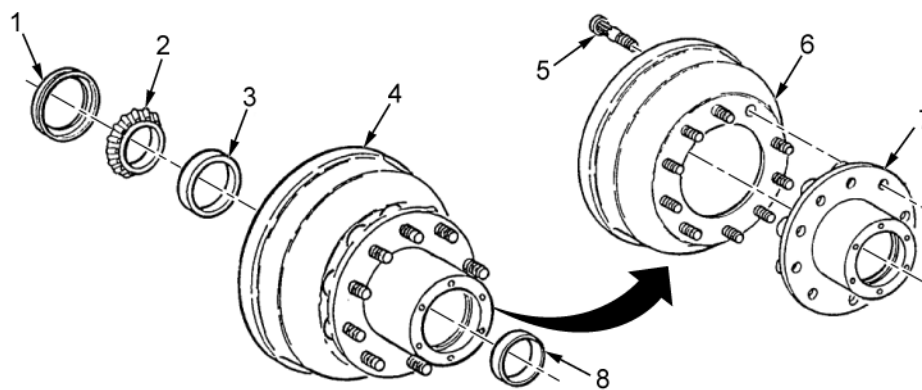
CAUTION

Note thread type of the studs removed; studs are either right-hand or left-hand - inner or outer. The same type of studs must be reinstalled when replacing studs, or damage to equipment may result.

NOTE

If the drum must be turned/repared, the wheel hub assembly and brake drum must be separated.

4. Drive ten studs (Figure 3, Item 5) from hub and drum assembly (Figure 3, Item 4).
5. Separate brake drum (Figure 3, Item 6) and wheel hub (Figure 3, Item 7).



HETT0382

Figure 3. Hub and Drum Repair.

WARNING**SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
 - The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
 - Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
 - Fire extinguishers should be placed nearby when using solvent cleaning compound.
 - Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
 - Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.
- Failure to follow these warnings may result in injury or death to personnel.

NOTE

To ensure enough bearing grease has been packed into the bearing cones, examine small side of the cone to see if grease has passed through and correctly filled the bearing cavities.

6. Clean all grease from parts removed in degreasing tank using cleaning solvent compound. Using grease, a lubrication gun, and a bearing packer, pack inner and outer wheel bearing cones, forcing grease into wheel bearing cavities between rollers from large end of cones.
7. Liberally hand-apply grease to axle.

8. Align wheel hub (Figure 4, Item 7) and brake drum assembly (Figure 4, Item 6), and drive ten studs (Figure 4, Item 5) through brake drum and into wheel hub.

CAUTION

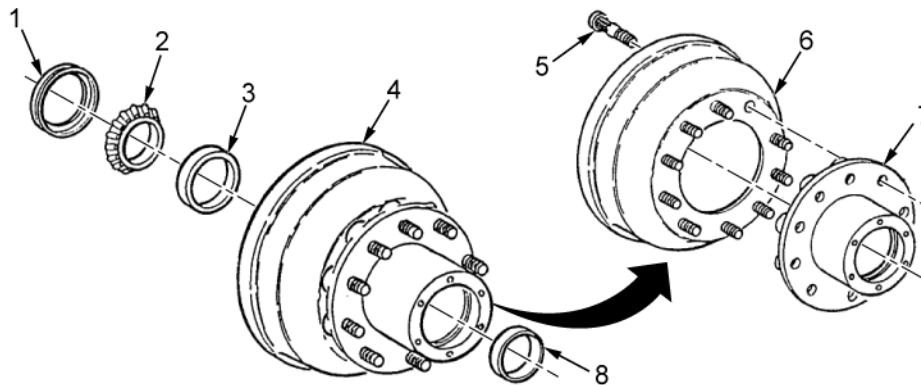
When installing inner and outer bearing cups, apply driving force to outer edges of cup. Rotate driving points to ensure bearing cups are being installed evenly and correctly, or damage to cups may result.

9. Place hub and drum assembly (Figure 4, Item 4) on flat surface and install inner tapered roller bearing cup (Figure 4, Item 3).
10. Install outer tapered roller bearing cup (Figure 4, Item 8) into hub and drum assembly (Figure 4, Item 4).

NOTE

When installing a plain encased seal, apply driving force to outer edges of seal. Rotate driving points to ensure the seal is being installed evenly and correctly or damage to the seal may result.

11. Install inner tapered roller bearing cone (Figure 4, Item 2) into hub and drum assembly (Figure 4, Item 4) and, using a soft-faced hammer, install plain encased seal (Figure 4, Item 1).



HETT0382

Figure 4. Seal Installation.

END OF TASK

INSTALLATION**WARNING**

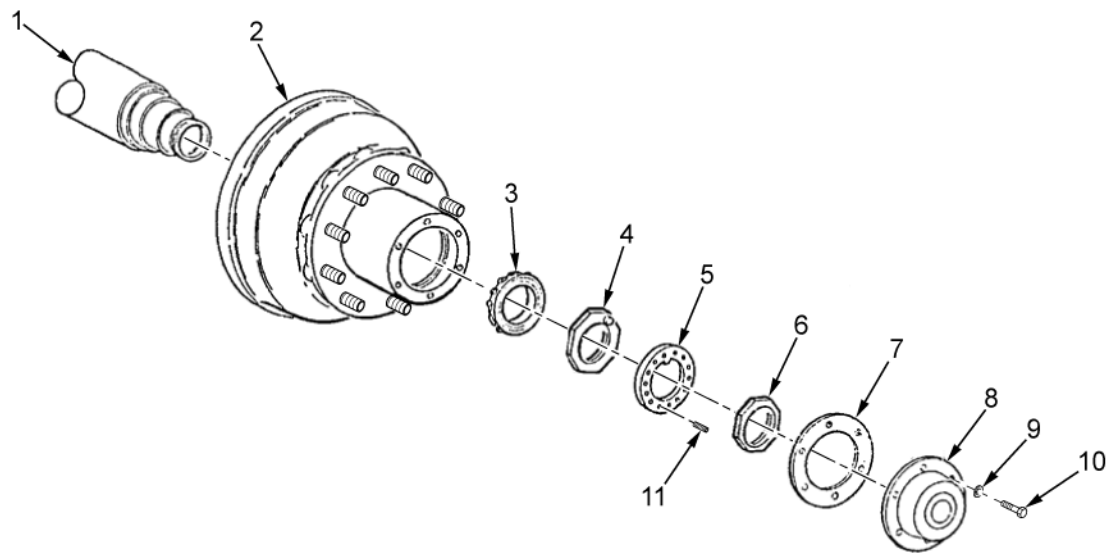
To avoid serious injury to personnel when removing hub and drum assembly from the axle, two persons are required. One person removes parts, and one person supports hub and drum assembly in place on the axle.

1. Use two personnel to align and install hub and drum assembly (Figure 5, Item 2) onto axle (Figure 5 Item 1).
2. Install outer tapered roller bearing cone (Figure 5, Item 3) onto axle (Figure 5, Item 1). Install wheel bearing adjusting nut (Figure 5, Item 4) onto axle.
3. Use 0 to 600 lb-ft (813 Nm) torque wrench and 3-7/8 in. wheel bearing socket to torque wheel bearing adjusting nut (Figure 5, Item 4) to 100 lb-ft (135 Nm) while rotating hub and drum assembly (Figure 5, Item 2) in both directions to ensure all bearing surfaces come in full contact and that seal seats completely.
4. Loosen wheel bearing adjusting nut (Figure 5, Item 4) completely and re-torque to 50 lb-ft (68 Nm).

CAUTION

Failure to back off wheel bearing adjusting nut as specified will result in premature failure of the wheel bearing and damage to equipment.

5. Loosen wheel bearing adjusting nut (Figure 5, Item 4) 1/6 to 1/4 turn so that dowel on wheel bearing adjusting nut aligns with one of several large unthreaded holes in lockwasher (Figure 5, Item 5).
6. Install new lockwasher (Figure 5, Item 5). Ensure dowel on wheel bearing adjusting nut (Figure 5, Item 4) fully engages an unthreaded hole in lockwasher.
7. Install wheel bearing jamnut (Figure 5, Item 6) onto axle (Figure 5, Item 1). Use 0 to 600 lb-ft (813 Nm) torque wrench and 3-1/4 in. wheel bearing socket to torque wheel bearing jam nut to 250 to 300 lb-ft (339 to 407 Nm).
8. Install setscrew (Figure 5, Item 11) into one of four small threaded holes in lockwasher (Figure 5, Item 5) and tighten until setscrew firmly bottoms out against adjusting nut (Figure 5, Item 4). Approximately 1/8 in. of set screw will protrude out over flat of jamnut.
9. Install new gasket (Figure 5, Item 7) and hub cap (Figure 5, Item 8) onto hub and drum assembly (Figure 5, Item 2). Install six new lockwashers (Figure 5, Item 9) and capscrews (Figure 5 item 10). Use 1/2 in. drive torque wrench to torque six capscrews to 15 to 20 lb-ft (20 to 27 Nm).



HETT0383

Figure 5. Installation of Hub and Drum Assembly.

END OF TASK

FOLLOW-ON MAINTENANCE

Install wheels (WP 0078, WP 0079, WP 0080, and WP 0081) on affected bogie.

Uncage brakes (WP 0023).

END OF WORK PACKAGE

FIELD MAINTENANCE**TIRE**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Materials/Parts

Lubricant Tire and Rim, Quart Can (WP 0170, Item 19)

Personnel Required

2

References

TM 9-2610-200-14
TM 9-2330-381-24P
Tire Balancer Operators Manual TM 9-4910-743-14&P

Equipment Conditions

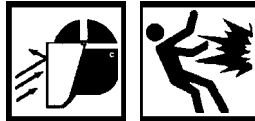
Wheel and tire removed from semitrailer (WP 0078,
WP 0079, WP 0080, or WP 0081)

GENERAL INFORMATION

This work package contains instructions for removal and installation of the tire.

REMOVAL

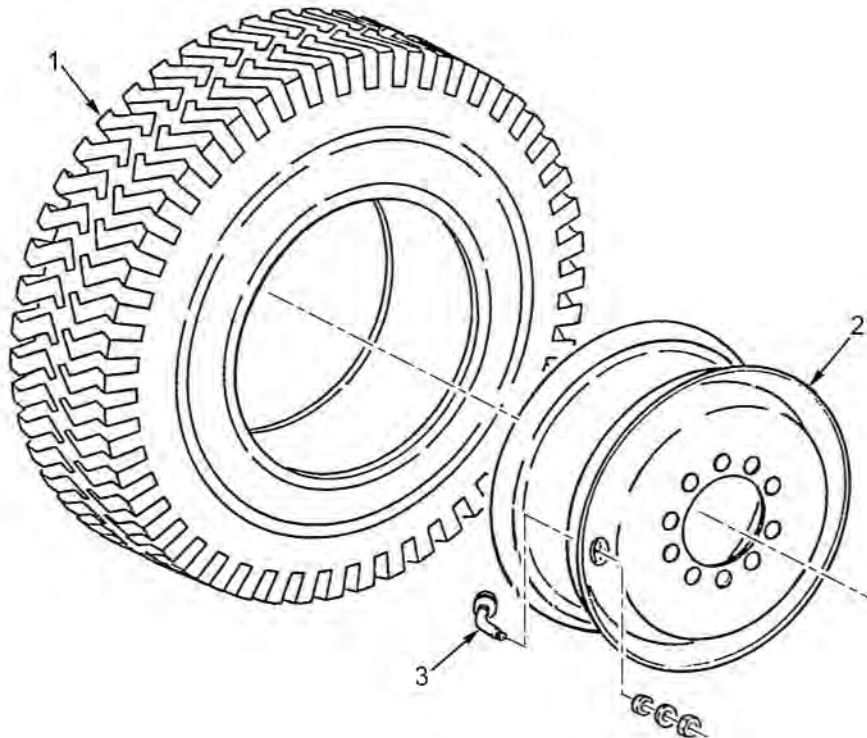
1. Remove valve cap from valve stem (Figure 1, Item 3).
2. Use pneumatic tire valve repair tool and remove valve from valve stem (Figure 1, Item 3). Run a piece of wire through valve stem to ensure that it is not plugged. Allow all air from inside of tire to escape.

WARNING

Before breaking tire bead, ensure no air pressure remains in tire. Failure to follow this warning may result in serious injury or death to personnel.

CAUTION

- Use tire and rim lubricant as necessary to avoid damaging tire beads when disassembling tire from wheel.
 - **Never use petroleum-based products such as oil or grease when disassembling tires from wheels. Petroleum-based products may damage tires. Use only approved tire and rim lubricant.**
3. Use two personnel, bead breaker tire iron, and double-ended tire iron to break bead on tire and remove tire (Figure 1, Item 1) from wheel (Figure 1, Item 2).
 4. Remove valve stem (Figure 1, Item 3) from wheel (Figure 1, Item 1).



HETT0384

Figure 1. Removal of Valve Stem and Tire.

5. Inspect wheel for damage, cracks, corrosion, dents, and warping. Check for elongated mounting holes in wheel. If defective, replace wheel. Remove rust, oil, and lubricant residue from wheel.
6. Inspect valve stem for leaky valve, corrosion, cuts or nicks, blockage, dents, or non-sealing surface. If defects exist, replace valve stem.
7. Inspect tire beads, sidewalls, treads, and shoulders in accordance with TM 9-2610-200-14. If defects are found, repair tire in accordance with TM 9-2610-200-14.
8. Inspect complete inside surface of tire/inner liner for imperfections, discoloration, holes, or irregular surface areas. Remove any foreign material such as paper, stones, dirt, water, etc.

END OF TASK

INSTALLATION

1. Use valve stem fishing tool and install valve stem (Figure 2, Item 3) onto wheel (Figure 2, Item 2). Ensure valve has been removed from inside valve stem (Figure 2, Item 3).

WARNING

DO NOT use retreads on the M1000 semitrailer. Only tires listed in TM 9-2330-381-24P, Repair Parts and Special Tools List (RPSTL), are authorized for use. Failure to follow this warning may result in tire failure and may cause equipment damage and serious injury or death to personnel.

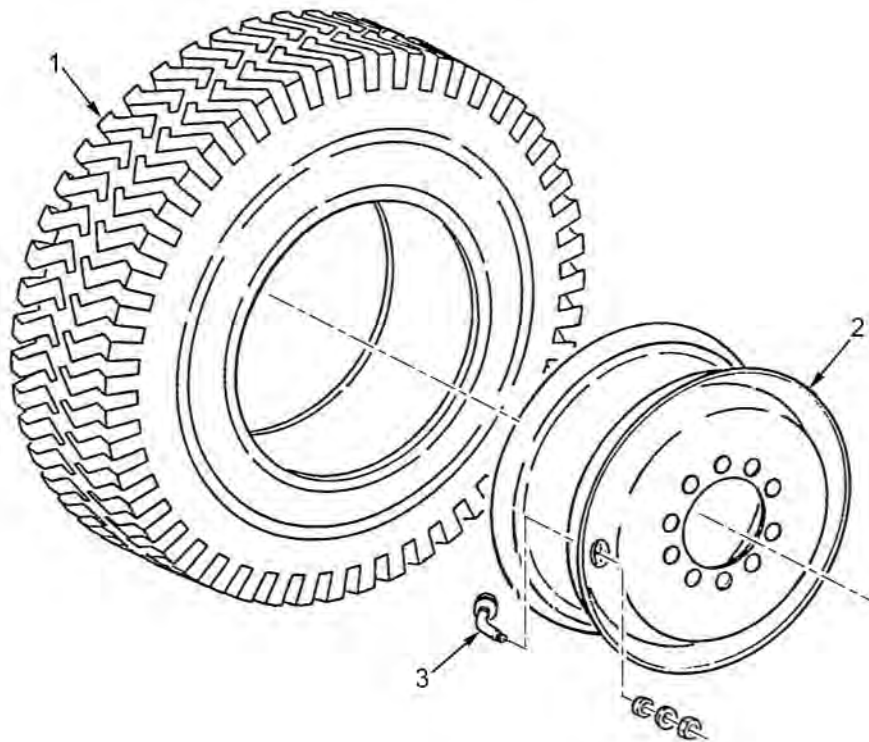
2. Use two personnel, bead breaker tire iron, and double-ended tire iron to install tire (Figure 2, Item 1) onto wheel (Figure 2, Item 2).

WARNING

- Tire may explode. Place wheel and tire in safety cage before inflating. Stay back at least 10 feet (3.1 m) from cage when inflating tire. Always stay out of the trajectory area. Always use an air hose extension (10-ft. [3.1 m] minimum), a snap-on chuck, and an in-line inflator gauge.
- When wheel/tire assembly is in safety cage, DO NOT lean against, stand on, or reach over into the cage.
- Never inflate tire over 40 psi (276 kPa) to seat bead. If beads do not seat, deflate, demount, and check the tire/wheel match.
- When using compressed air, always wear safety goggles to prevent dirt and debris from entering your eyes. Compressed air stream must be less than 30 psi (207 kPa).

Failure to follow these warnings may result in serious injury or death to personnel.

3. Use air compressor and inflator gauge to inflate tire to reseal tire bead. Once tire bead is established, use pneumatic valve repair tool and insert valve into valve stem (Figure 2, Item 3).
4. Inflate tire to 95 psi \pm 5 psi (655 kPa \pm 34 kPa).
5. Pour water onto valve stem (Figure 2, Item 3) and inner and outer beads of tire to check for leaks.



HETT0384

Figure 2. Installation of Valve Stem and Tire.

6. Balance wheel using vehicle wheel balancer as required in accordance with TM 9-4910-743-14&P.

END OF TASK

FOLLOW-ON MAINTENANCE

Install wheel onto semitrailer (WP 0078, WP 0079, WP 0080, or WP 0081).

END OF WORK PACKAGE

FIELD MAINTENANCE**SPARE TIRE**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)
Davit (WP 0168, Item 29)

Equipment Conditions

Platform set at normal road height (WP 0008)
Gooseneck lowered to lowest position, if uncoupled
(WP 0007)

Personnel Required

2

GENERAL INFORMATION

This work package contains instructions for removal and installation of the spare tire.

REMOVAL**WARNING**

- The spare tire is heavy. Use the davit, as described below, to raise or lower spare tire to/from the gooseneck. When on top of the gooseneck and removing or installing spare tire, always hold onto handrail or davit with one hand to avoid falling.
- On some semitrailers a solar battery charger is mounted to top of gooseneck directly in front of spare tires. Personnel working on top of the gooseneck must take **EXTREME** care not to step on the gooseneck solar battery charger or trip over it.

Failure to follow these warnings may result in serious injury or death to personnel or damage to equipment.

NOTE

The following procedures apply to either the curbside or streetside spare tires as mounted on the gooseneck.

1. Use ratchet, extension, and lug socket to remove right-hand threaded lug nut (Figure 1, Item 10) from spare tire (Figure 1, Item 6).
2. Use ratchet, extension, and 1 1/8 in. socket to remove two capscrews (Figure 1, Item 11), lockwashers (Figure 1, Item 12), and washers (Figure 1, Item 13) that secure spare tire (Figure 1, Item 6) to spare tire bracket (Figure 1, Item 14).

WARNING

Always use leather gloves when handling cable. Cable can become frayed during use. Failure to follow this warning may result in serious injury to personnel.

3. Unhook davit winch cable (Figure 1, Item 7) from stow point on davit (Figure 1, Item 1) base.
4. Remove linch pin (Figure 1, Item 4) from hitch pin (Figure 1, Item 5) on winch cable pulley clamp (Figure 1, Item 3) and reposition pulley clamp on davit arm (Figure 1, Item 1) near davit winch (Figure 1 item 2). Insert hitch pin and linch pin to secure pulley clamp.
5. From gooseneck (Figure 1, Item 15) remove linch pin (Figure 1, Item 8) from hitch pin (Figure 1, Item 9) at base of davit and swing davit arm (Figure 1, Item 1) and winch (Figure 1, Item 2) over spare tire (Figure 1, Item 6).

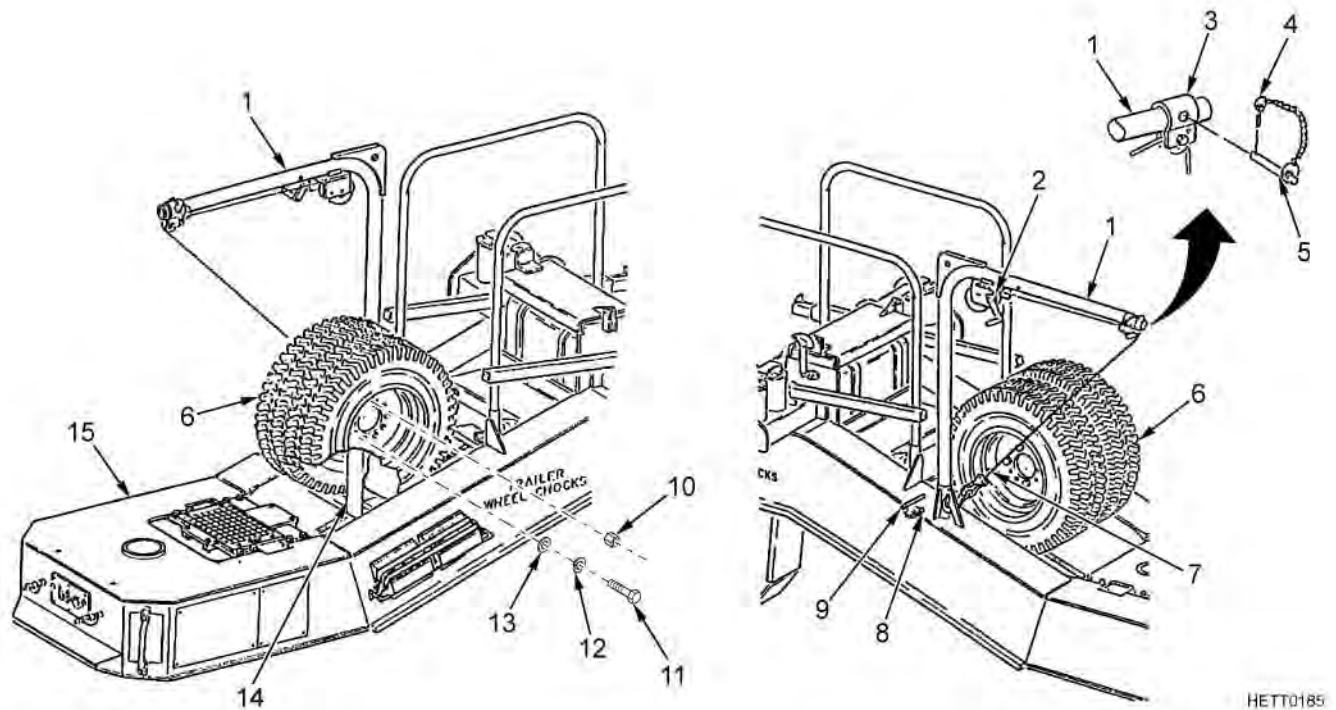


Figure 1. Removal of Spare Tire.

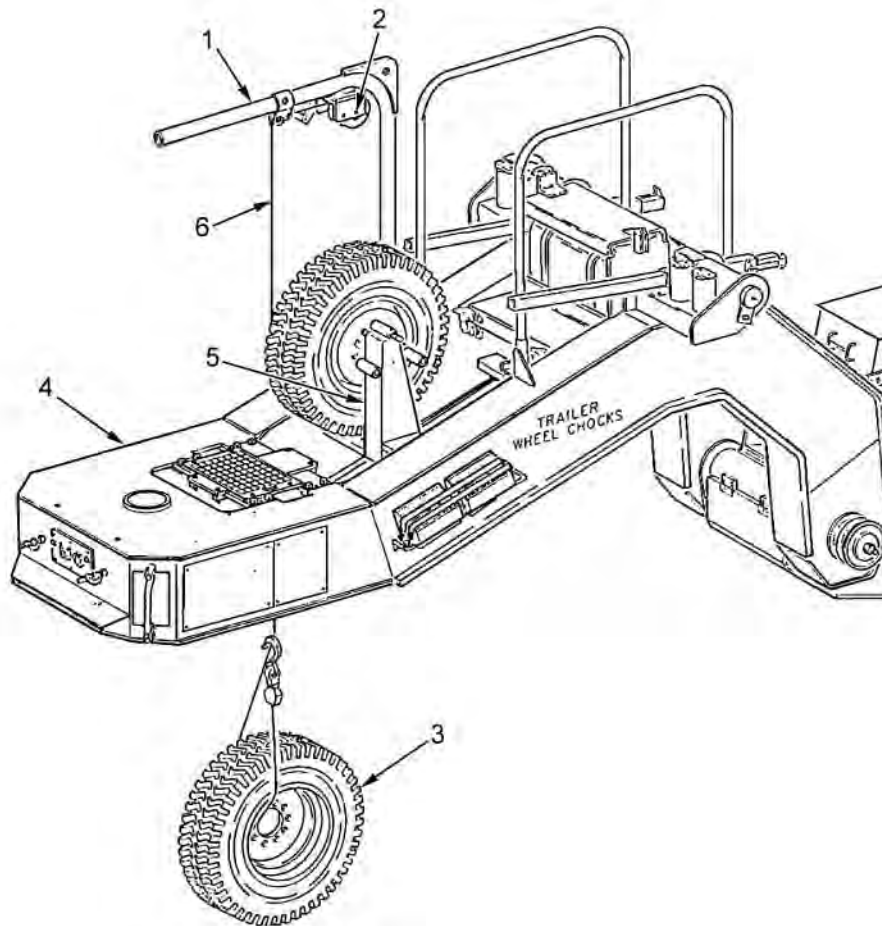
6. Attach winch cable (Figure 2, Item 6) to spare tire (Figure 2, Item 3) by passing hook end of cable through center of tire rim and hooking back onto cable atop spare tire.

WARNING



On some semitrailers a solar battery charger is mounted to top of gooseneck directly in front of spare tires. Personnel working on top of the gooseneck must take EXTREME care not to step on the gooseneck solar battery charger or trip over it. Failure to follow this warning may result in serious injury to personnel or damage to equipment.

7. Operate davit winch (Figure 2, Item 2) to lift spare tire (Figure 2, Item 3) off of bracket (Figure 2, Item 5). Swing davit arm (Figure 2, Item 1) and spare tire out over curbside of gooseneck (Figure 2, Item 4) and operate winch to lower spare tire to ground.
8. Spotter must remove winch cable (Figure 2, Item 6) from spare tire (Figure 2, Item 3) once tire is on the ground.



HETT0186

Figure 2. Removal of Spare Tire.

END OF TASK

INSTALLATION

WARNING



- Always use leather gloves when handling cable. Cable can become frayed during use. Failure to follow this warning may result in serious injury to personnel.
 - On some semitrailers a solar battery charger is mounted to top of gooseneck directly in front of spare tires. Personnel working on top of the gooseneck must take **EXTREME** care not to step on the gooseneck solar battery charger or trip over it. Failure to follow this warning may result in serious injury to personnel or damage to equipment.
1. On curbside of gooseneck (Figure 3, Item 15), on ground, attach winch cable (Figure 3, Item 7) from davit arm (Figure 3, Item 1) to spare tire (Figure 3, Item 6) by passing hook end of cable through center of tire rim and hooking back on cable atop spare tire.

WARNING



The spare tire is heavy. Use the davit, as described below, to raise or lower spare tire to/from the gooseneck. When on top of the gooseneck and removing or installing spare tire, always hold onto handrail or davit with one hand to avoid falling and causing injury to personnel.

2. Use davit winch (Figure 3, Item 2) to raise up spare tire (Figure 3, Item 6) onto gooseneck (Figure 3, Item 15).
3. Swing davit arm (Figure 3, Item 1) and winch cable (Figure 3, Item 7) with spare tire (Figure 3, Item 6) over into position on spare tire bracket (Figure 3, Item 14).
4. Align spare tire (Figure 3, Item 6) onto studs on spare tire bracket (Figure 3, Item 14).
5. Install right-hand lug nut (Figure 3, Item 10), two capscrews (Figure 3, Item 11), lockwashers (Figure 3, Item 12), and washers (Figure 3, Item 13) onto spare tire bracket (Figure 3, Item 14).
6. Remove winch cable (Figure 3, Item 7) from spare tire.
7. Remove hitch pin (Figure 3, Item 5) from winch cable pulley clamp (Figure 3, Item 3) and move pulley clamp to stow position at end of davit arm (Figure 3, Item 1). Install hitch pin and secure with linch pin (Figure 3, Item 4).
8. Reposition davit arm (Figure 3, Item 1) to stow position, install hitch pin (Figure 3, Item 9), and secure with linch pin (Figure 3, Item 8).
9. Attach winch cable (Figure 3, Item 7) hook at base of davit arm (Figure 3, Item 1) and take up slack in cable.

NOTE

Restow all tools and equipment used during this procedure.

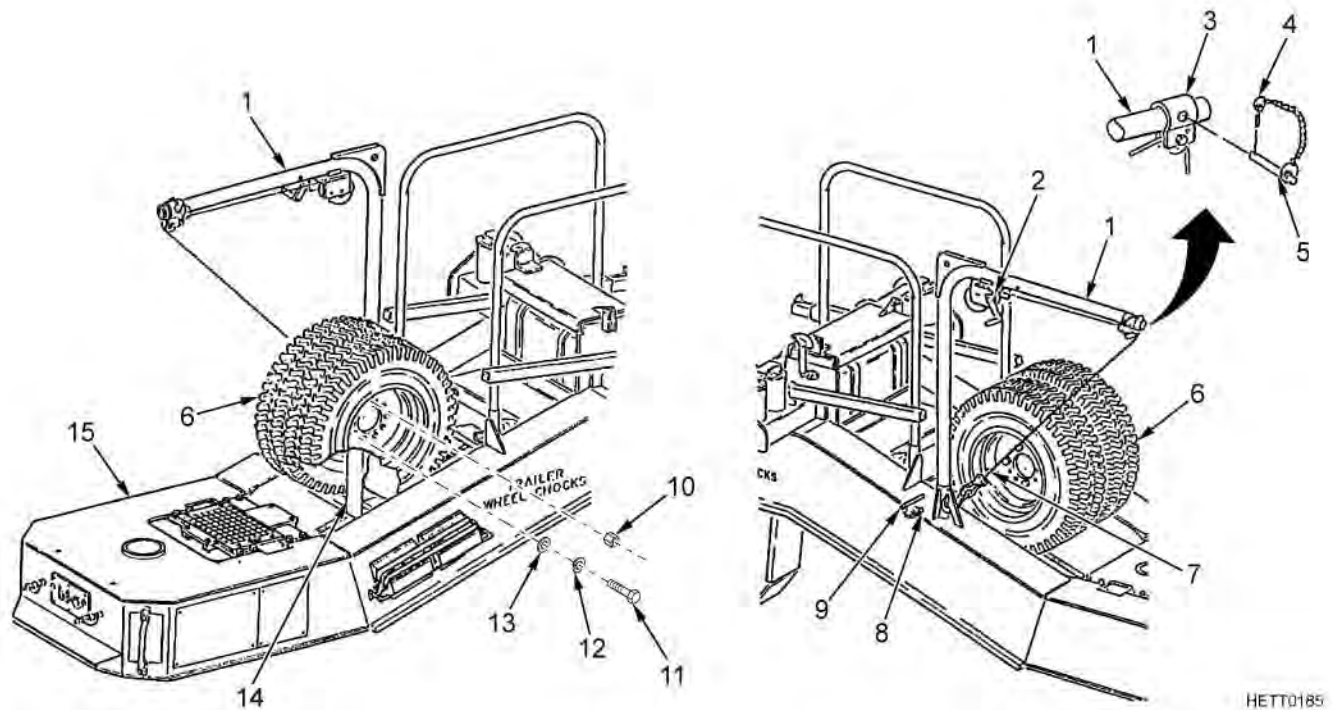


Figure 3. Installation of Spare Tire.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
OUTER/OUTER WHEEL

INITIAL SETUP:**Tools and Special Tools**

Standard Army Tool Set (WP 0168, Item 11)
Chain Assembly, 1/2 in., 11 in. L (WP 0168, Item 30)
Metallic Tube, 36 in. L (WP 0168, Item 31)

Equipment Conditions

Gooseneck lowered to lowest position, if uncoupled
(WP 0007)
If necessary, spare tire removed (WP 0077)

Personnel Required

2

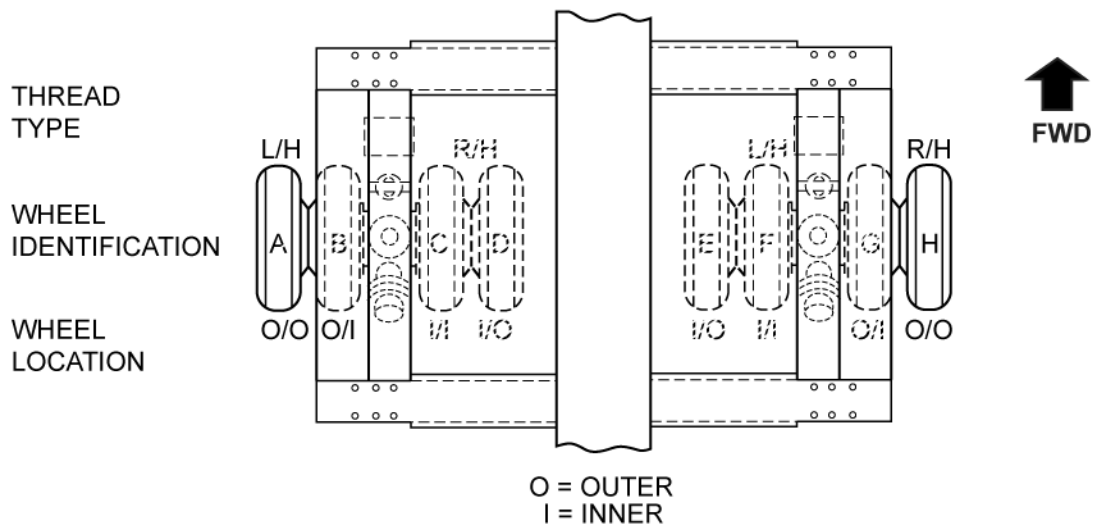
GENERAL INFORMATION

This work package contains instructions for removal and installation of the outer/outer wheel.

REMOVAL

NOTE

Wheel removal/installation is divided into four separate procedures. Refer to the diagram in Figure 1 for location, wheel designation, and thread types. Within each procedure, notes will identify wheels and right-hand/left-hand lug nuts or lug studs.



HETT0188

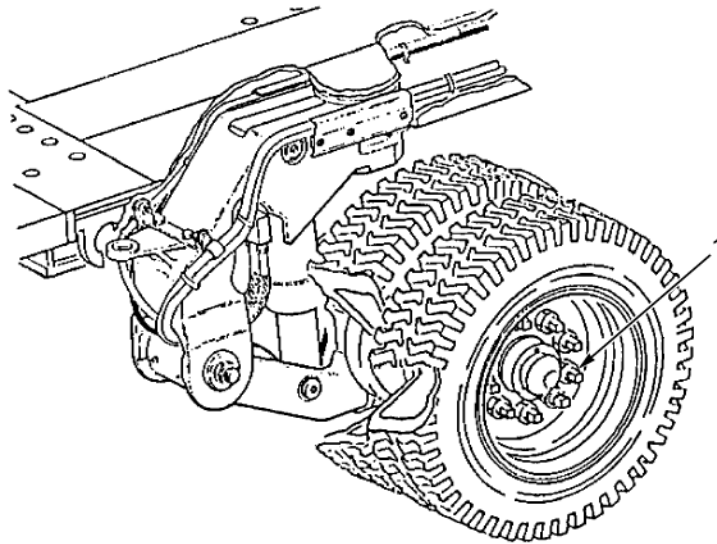
Figure 1. Wheel Descriptions.

1. Start and run Auxiliary Power Unit (APU) (WP 0005).
2. Adjust platform (WP 0008) to normal road height. Leave APU running to recharge battery.

CAUTION

Use Figure 1 for identification purposes. Wheel A has left-hand threaded lug nuts. Wheel H has right-hand threaded lug nuts. During removal, use correct rotation for each type of thread or damage to lug nuts and lug studs may result.

3. Use ratchet, 8 in. extension, metallic tube, and lug socket to loosen ten lug nuts (Figure 2, Item 1).



HETT0189

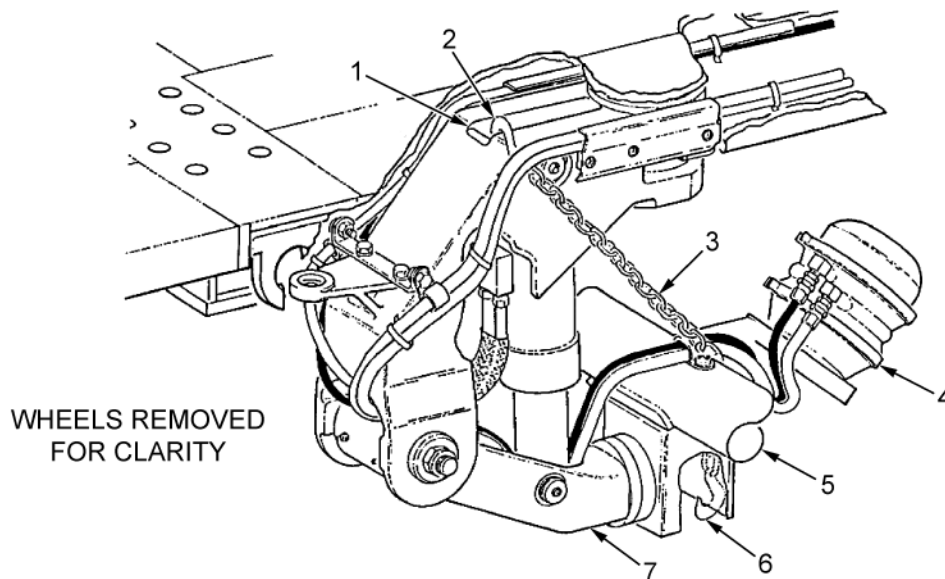
Figure 2. Loosen Lug Nuts.

4. Attach suspension chain (Figure 3, Item 3) to bogie (Figure 3, Item 7) per steps 5 and 6.

CAUTION

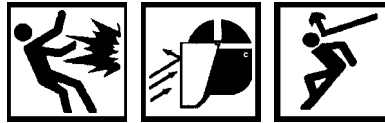
When securing hook to axle, ensure the suspension chain does not cross over any hydraulic lines or air brake hoses. If chain crosses over lines, chafing of a line/hose, loss of air brake pressure, loss of hydraulic fluid, or damage to equipment may result.

5. Attach end (top) hook (Figure 3, Item 2) of suspension chain (Figure 3, Item 3) along outboard side of bogie (Figure 3, Item 7), beneath both hydraulic and air brake lines, into opening in upper suspension arm casting of bogie (Figure 3, Item 1).
6. Attach bottom hook (Figure 3, Item 6) of suspension chain (Figure 3, Item 3) onto back end of square casting under axle (Figure 3, Item 5), outboard of parking brake chamber (Figure 3, Item 4).



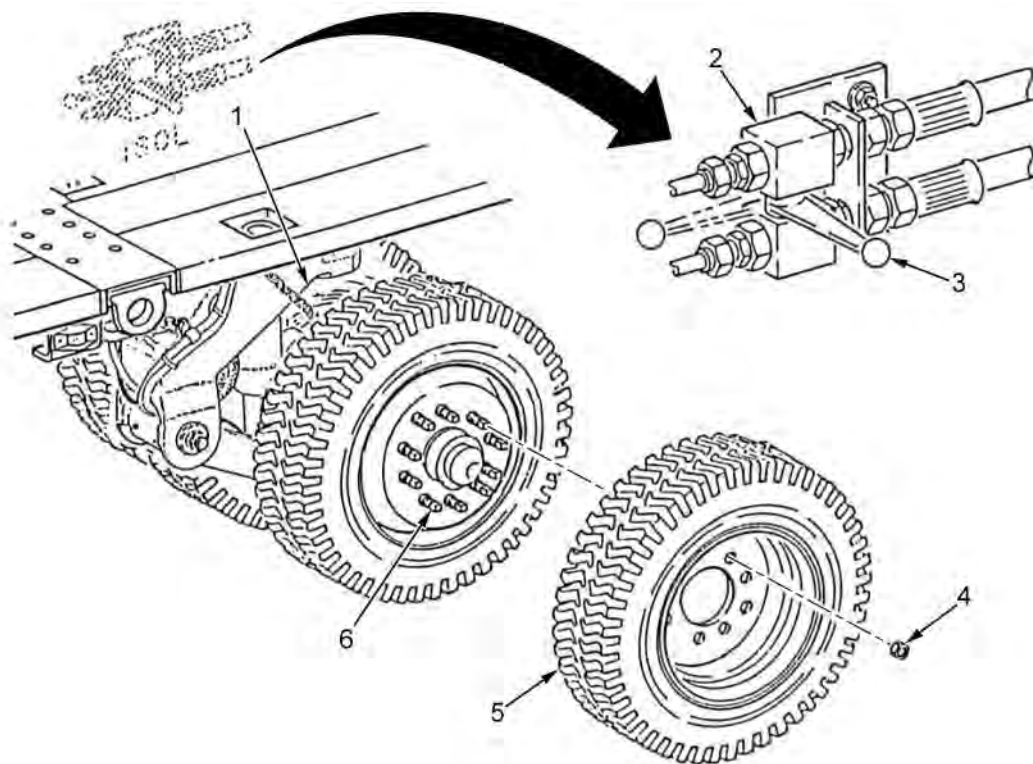
HETT0190

Figure 3. Securing Bogie.

WARNING

Ensure suspension isolation valve at the affected bogie is closed (handle facing outward) prior to adjusting platform height or the suspension chain may break and cause serious injury or death to personnel and damage to equipment.

7. At affected bogie (Figure 4, Item 1), close valve handle (Figure 4, Item 3) on suspension isolation valve (Figure 4, Item 2), with handle facing outboard from center of platform.
8. Raise platform (WP 0008) until all tires for affected bogie (Figure 4, Item 1) are off ground.
9. Remove lug nuts (Figure 4, Item 4) and outer/outer wheel (Figure 4, Item 5) from lug studs (Figure 4, Item 6) on affected bogie (Figure 4, Item 1).
10. If other tire maintenance procedures are to be performed, let APU run to charge battery.



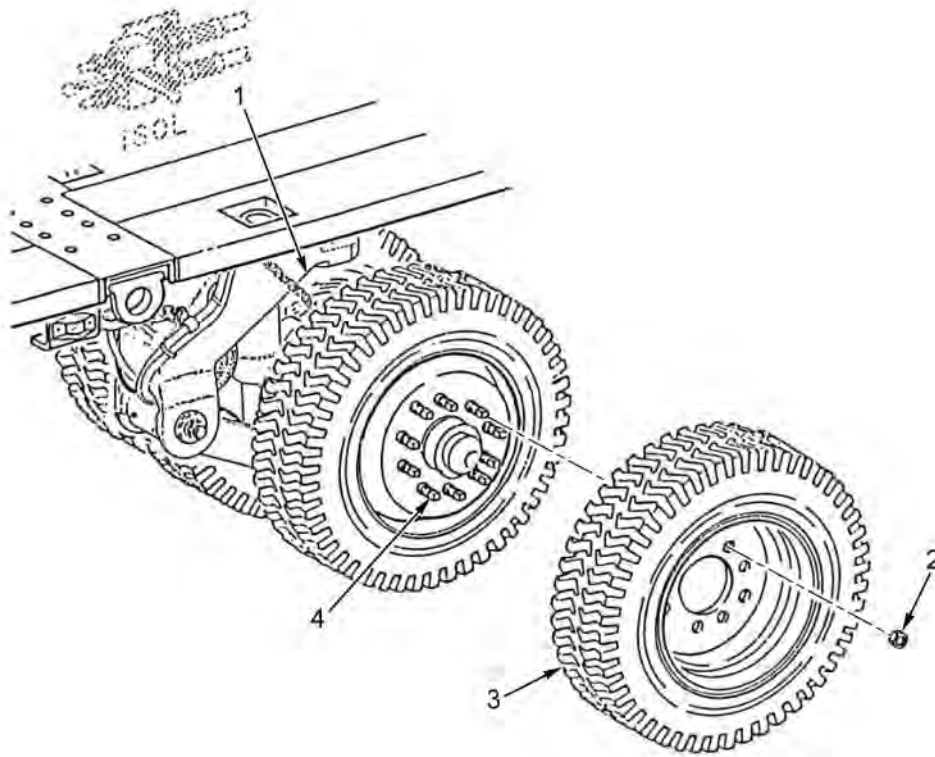
HETT0191

Figure 4. Removal of Tire Assembly.

END OF TASK

INSTALLATION

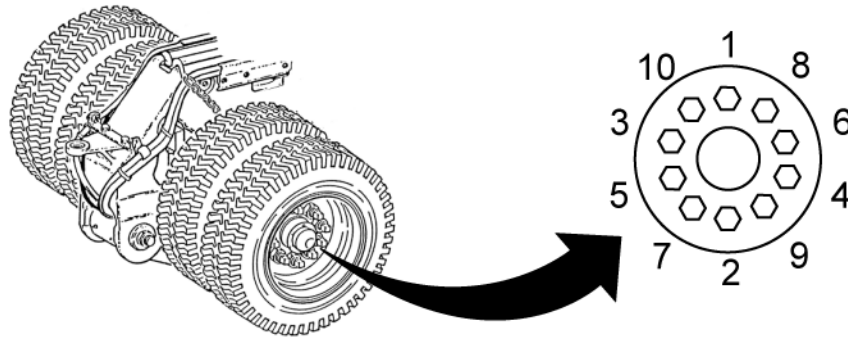
1. Start Auxiliary Power Unit (APU) (WP 0005) if not running.
2. Inspect wheels for damage. Inspect stud holes for debris and clean if necessary.
3. Clean all threads on studs and nuts.
4. Align outer/outer wheel (Figure 5, Item 3) on lug studs (Figure 5, Item 4) so that valve stem is 180 degrees opposite valve stem on inner wheel of bogie (Figure 5, Item 1).
5. Install top and bottom lug nuts (Figure 5, Item 2) finger-tight to seat wheel (Figure 5, Item 3) properly.
6. Install and hand-tighten eight remaining lug nuts (Figure 5, Item 2).
7. Hand-tighten all ten lug nuts in sequence shown in Figure 6.



HETT0829

Figure 5. Installation and Tightening of Assembly.

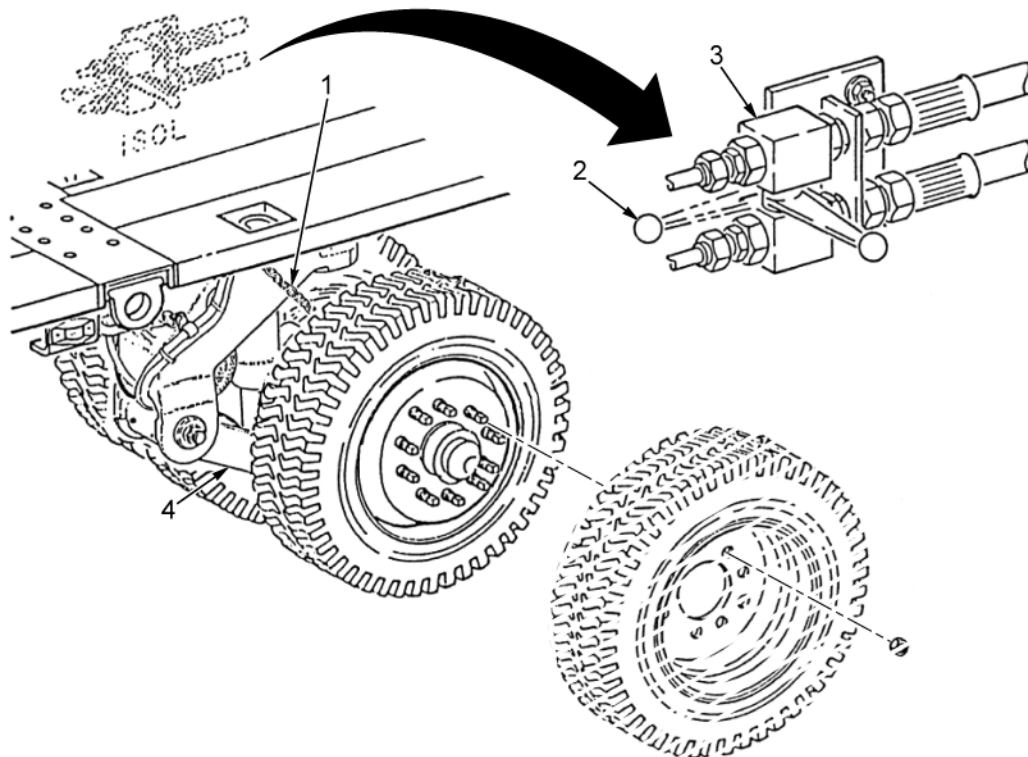
8. Lower platform (WP 0008) until all tires on affected bogie contact ground.
9. Use ratchet, 8 in. extension, and lug socket to continue to tighten lug nuts in sequence shown in Figure 6.
10. Notify unit maintenance that lug nuts need to be torqued to 450 to 501 lb-ft (610 to 680 Nm). Torque in sequence shown in Figure 6.



HETT0800

Figure 6. Tightening Sequence for Outer Dual Set.

10. Open valve handle (Figure 7, Item 2) on suspension isolation valve (Figure 7, Item 3 and WP 0004) at affected bogie (Figure 7, Item 4) with handle facing inboard toward front of semitrailer.
11. Continue to lower platform (WP 0008) until there is enough clearance for chain (Figure 7, Item 1) to be removed from affected bogie (Figure 7, Item 4).
12. If other tire maintenance procedures are to be performed, let APU run to charge battery.
13. Remove suspension chain (Figure 7, Item 1) from affected bogie (Figure 7, Item 4).



HETT0828

Figure 7. Lowering Platform and Removing Suspension Chain.

NOTE

Restow all tools and equipment used during this procedure.

END OF TASK

FOLLOW-ON MAINTENANCE

Notify unit maintenance that wheel on affected bogie requires torquing.

END OF WORK PACKAGE

FIELD MAINTENANCE**OUTER/INNER WHEEL**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)
Chain Assembly, 1/2 in., 11 in. L (WP 0168, Item 30)
Metallic Tube, 36 in. L (WP 0168, Item 31)

Equipment Conditions

Outer/outer wheel removed (WP 0078)
If necessary, spare tire removed (WP 0077)

Personnel Required

2

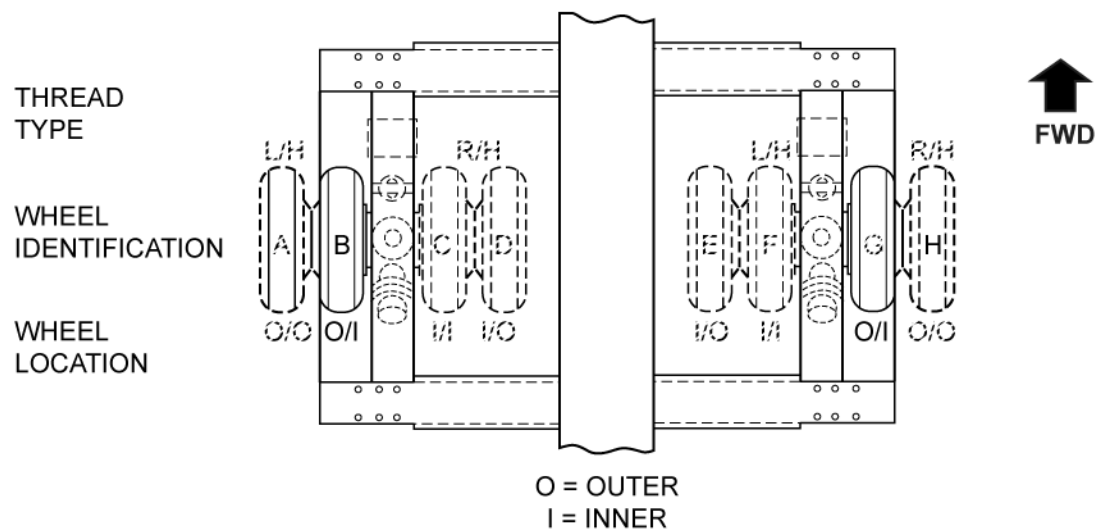
GENERAL INFORMATION

This work package contains instructions for removal and installation of the outer/inner wheel.

REMOVAL

NOTE

Wheel removal/installation is divided into four separate procedures. Refer to the diagram in Figure 1 for location, wheel designation, and thread types. Within each procedure, notes will identify wheels and right-hand/left-hand lug nuts or lug studs.



HETT0192

Figure 1. Tire/Wheel Identity.

1. Start and run Auxiliary Power Unit (APU) (WP 0005) if not running.
2. Lower platform (WP 0008) until all tires on affected bogie are on ground.

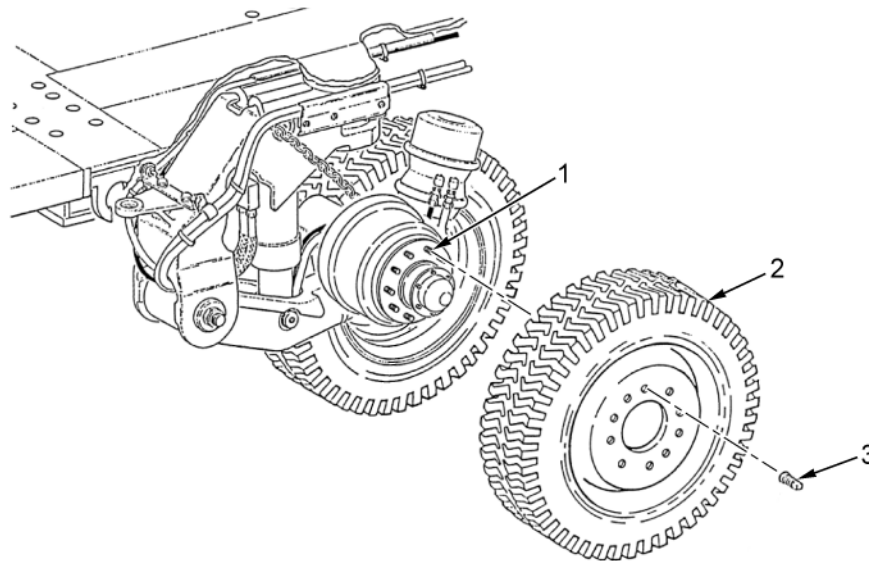
CAUTION

Use Figure 1 for identification purposes. Wheel B has left-hand threaded lug studs. Wheel G has right-hand threaded lug studs. During removal, use correct rotation for each type of thread or damage to lug nuts and lug studs may result.

3. Use ratchet, 8 in. extension, metallic tube, and lug socket to remove ten lug studs (Figure 2, Item 3).
4. Raise platform (WP 0008) until all tires for affected bogie are off ground.
5. Remove ten lug studs (Figure 2, Item 3) and outer/inner wheel (Figure 2, Item 2) from hub studs (Figure 2, Item 1) on affected bogie. Clean lug studs and hub studs.

NOTE

If other tire maintenance is to be performed, let APU run to charge battery.



HETT0193

Figure 2. Removal of Lug Studs.

END OF TASK

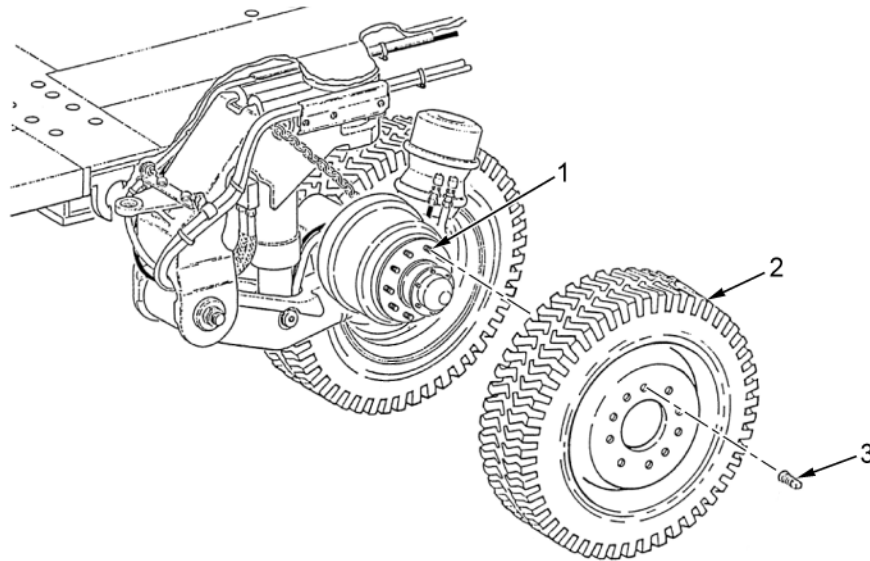
INSTALLATION

1. Align and install outer/inner wheel (Figure 3, Item 2) onto hub studs (Figure 3, Item 1) at affected bogie.

CAUTION

Use Figure 1 for identification purposes. Wheel B has left-hand threaded lug studs. Wheel G has right-hand threaded lug studs. Use correct rotation for each type of thread or damage to lug studs and hub studs may result.

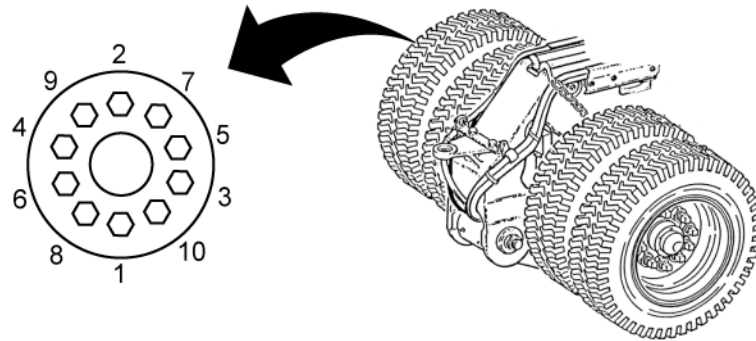
2. Use ratchet, 8 in. extension, and lug socket to install ten lug studs (Figure 3, Item 3) onto hub studs (Figure 3, Item 1) in sequence shown in Figure 4.



HETT0193

Figure 3. Installation of Lug Studs.

3. Start APU if not already running (WP 0005).
4. Lower platform (WP 0008) until all tires on affected bogie contact ground.
5. Use ratchet, 8 in. extension, and lug socket to continue to tighten lug studs in sequence shown in Figure 4.
6. Notify unit maintenance that lug studs need to be torqued to 450 to 501 lb-ft (610 to 680 Nm). Torque in sequence shown in Figure 4.



HETT0812

Figure 4. Tightening Sequence for Inner Dual Set.

7. Raise platform (WP 0008) until all tires for affected bogie are off ground.
8. Shut down APU (WP 0005).

END OF TASK

FOLLOW-ON MAINTENANCE

Install outer/outer wheel (WP 0078).

Notify unit maintenance that wheel on affected bogie requires torquing.

END OF WORK PACKAGE

FIELD MAINTENANCE**INNER/OUTER WHEEL**

INITIAL SETUP:**Tools and Special Tools**

Standard Army Tool Set (WP 0168, Item 28)
Chain Assembly, 1/2 in., 11 in. L (WP 0168, Item 30)
Metallic Tube, 36 in. L (WP 0168, Item 31)

Equipment Conditions

Platform set at normal road height (WP 0008)
Gooseneck lowered to lowest position, if uncoupled
(WP 0007)
If necessary, spare tire removed (WP 0077)

Personnel Required

2

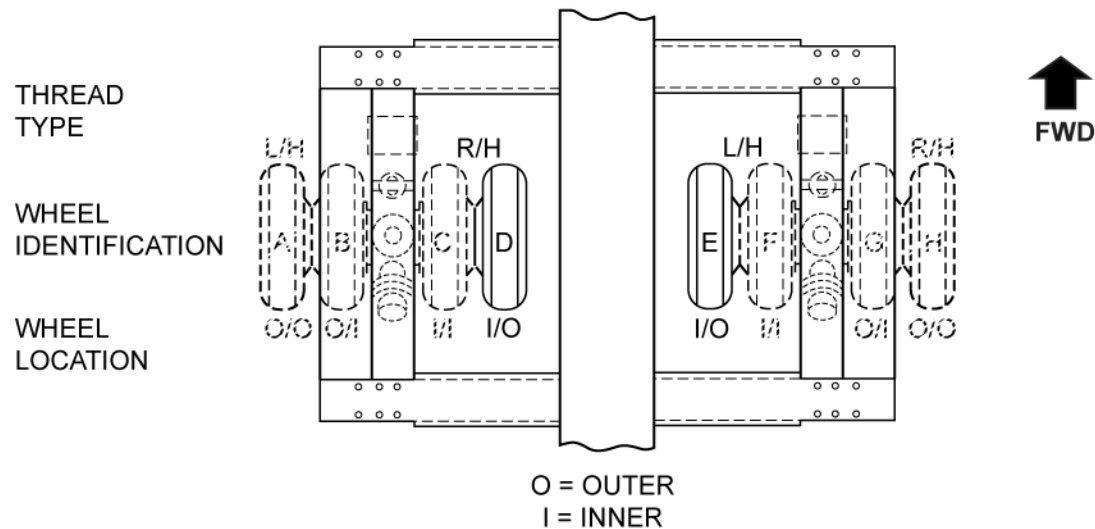
GENERAL INFORMATION

This work package contains instructions for the removal and installation of the inner/outer wheel.

REMOVAL

NOTE

Wheel removal/installation is divided into four separate procedures. Refer to the diagram in Figure 1 for location, wheel designation, and thread types. Within each procedure, notes will identify wheels and right-hand/left-hand lug nuts or lug studs.



HETT0194

Figure 1. Tire/Wheel Identity.

CAUTION

Push steering or non-steering connecting link forward, toward front of semitrailer, to allow clearance for suspension assembly to be rotated or damage to equipment may result.

1. Use 1 1/8 in. socket, ratchet, and adjustable wrench to loosen and remove safety pin (Figure 2, Item 6) and nut (Figure 2, Item 7) from capscrew (Figure 2, Item 2). Leave capscrew inside of connecting link (Figure 2, Item 1).
2. Use suitable prying device (Figure 2, Item 4) to lift up or press down and remove connecting link (Figure 2, Item 1) from affected bogie (Figure 2, Item 3). Once connecting link is pushed out of way, align and install nut (Figure 2, Item 7) and safety pin (Figure 2, Item 6) back onto capscrew (Figure 2, Item 2) for temporary storage.
3. If no. 1 bogie connecting link (Figure 2, Item 1) was disconnected, remove preformed packing (Figure 2, Item 5).

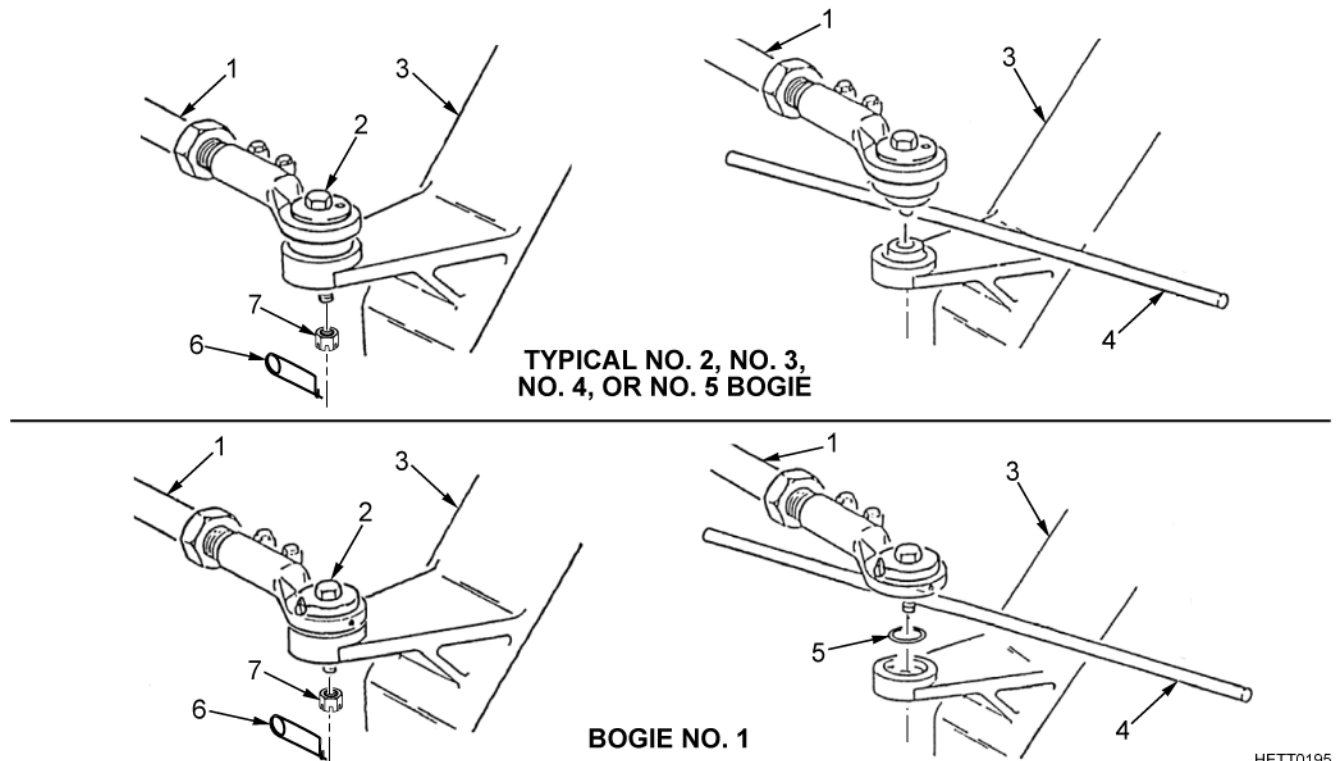


Figure 2. Removing Connecting Links.

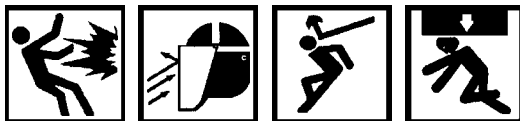
4. Start and run Auxiliary Power Unit (APU) (WP 0005).
5. Lower platform (WP 0008) to normal road height. Leave APU running to recharge battery.

CAUTION

When securing hook to axle, ensure the suspension chain does not contact any hydraulic lines or air brake hoses. If contact is made, chafing of a line/hose, loss of air brake pressure, loss of hydraulic fluid, or damage to equipment may result.

6. Attach suspension chain (Figure 3, Item 7) to bogie (Figure 3, Item 1) as per steps 7 and 8.
7. Attach top end hook (Figure 3, Item 2) of suspension chain (Figure 3, Item 7) along outboard side of bogie (Figure 3, Item 1), beneath both hydraulic and air brake lines (Figure 3, Item 5 and Item 6), into opening in upper suspension arm casting of bogie.
8. Attach bottom end hook (Figure 3, Item 10) of suspension chain (Figure 3, Item 7) onto back end of square casting under axle (Figure 3, Item 9), outboard of parking brake chamber (Figure 3, Item 8).

WARNING



Ensure suspension isolation valve at the affected bogie is closed (handle facing outward) prior to adjusting platform height or the suspension chain may break and cause serious injury or death to personnel and damage to equipment.

9. At affected bogie (Figure 3, Item 1), close valve handle (Figure 3, Item 4) on suspension isolation valve (Figure 3, Item 3), with handle facing outboard from center of platform.
10. Raise platform (WP 0008) until all tires for affected bogie are off ground.

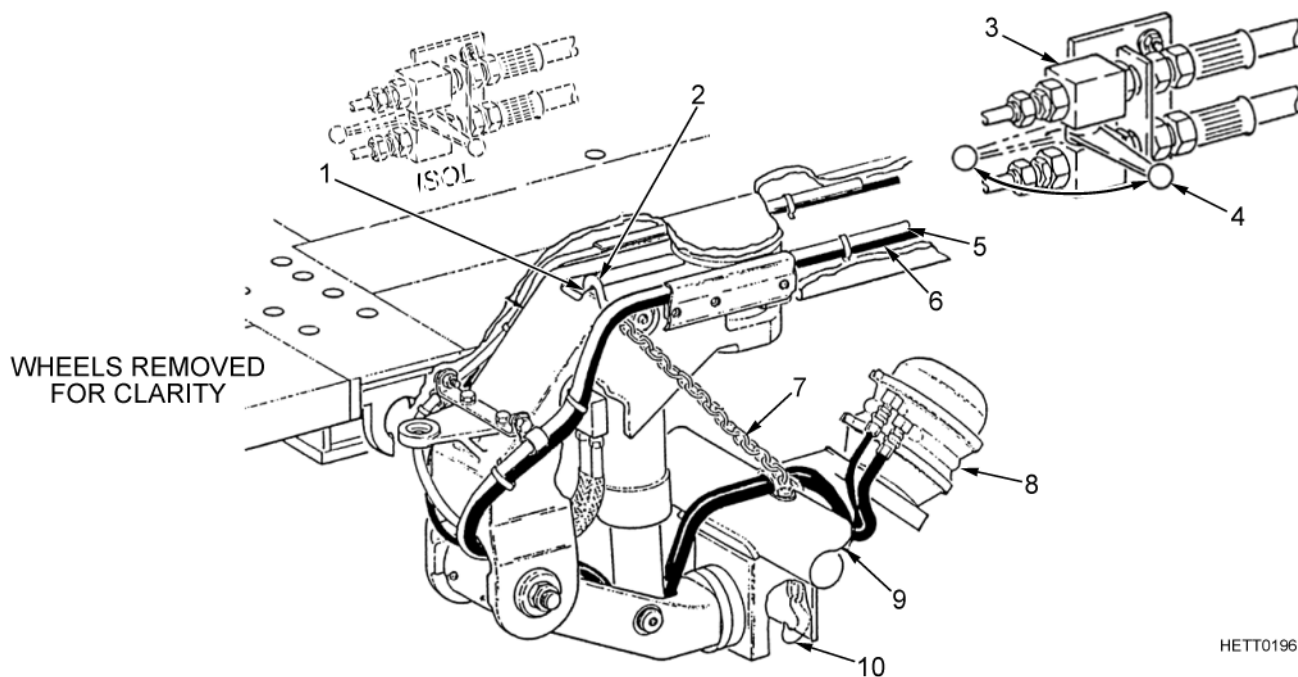


Figure 3. Raising Platform.

CAUTION

The bogie must be rotated outward from its normal position so that the linkage attaching point is outboard of the platform edge or damage to the hydraulic and/or pneumatic lines may result.

11. Start to turn bogie (Figure 4, Item 1) outboard, away from center of platform. Ensure no sharp bends, kinks, or excess strain exists on two hydraulic lines and air brake lines (Figure 4, Item 3 and Item 4) routed to affected bogie.

CAUTION

DO NOT turn bogie more than 90 degrees outboard from center of platform or damage to hydraulic and/or pneumatic lines may result.

12. Continue to turn bogie (Figure 4, Item 1) until bogie linkage attaching point (Figure 4, Item 2) is outboard of platform edge, and bogie axle (Figure 4, Item 5) is parallel with that side of platform, not to exceed 90 degrees from original forward position.
13. Lower platform (WP 0008) until all tires on affected bogie (Figure 4, Item 1) contact ground.

CAUTION

Use Figure 1 for identification purposes. Wheel E has left-hand threaded lug nuts. Wheel D has right-hand threaded lug nuts. During removal, use correct rotation for each type of thread or damage to lug nuts and lug studs may result.

14. Use ratchet, 8 in. extension, metallic tube, and lug socket to loosen ten lug nuts (Figure 4, Item 6).

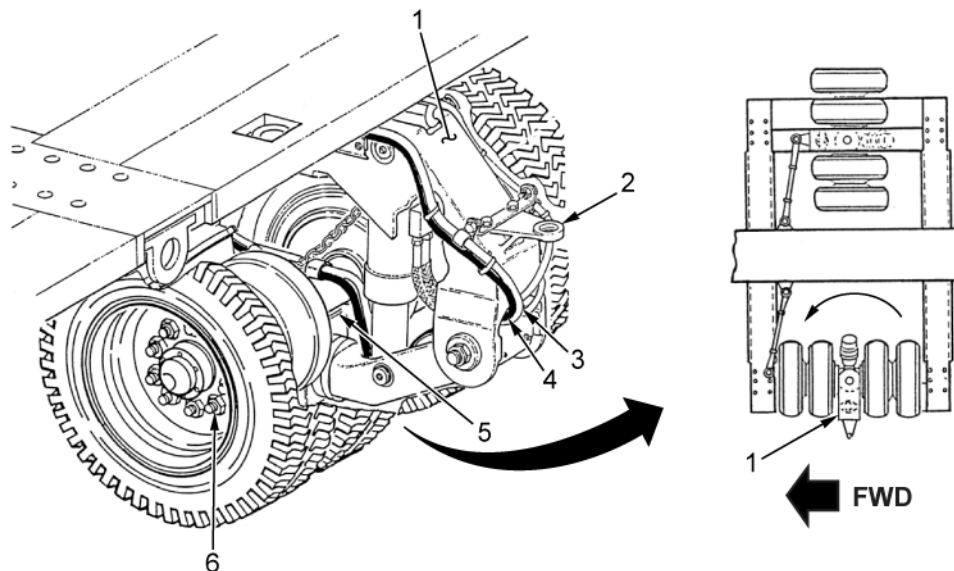
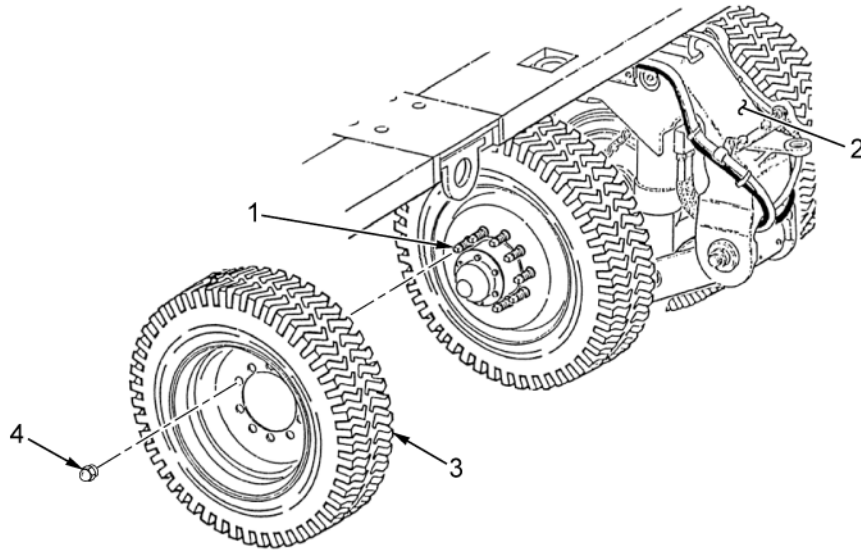


Figure 4. Bogie Linkage Attaching Removal Point.

HETT0197

15. Raise platform (WP 0008) until all tires for affected bogie are off ground.
16. Remove lug nuts (Figure 5, Item 4) and inner/outer wheel (Figure 5, Item 3) from lug studs (Figure 5, Item 1) on affected bogie (Figure 5, Item 2).
17. Leave APU running to charge battery if other tire maintenance procedures are to be performed.



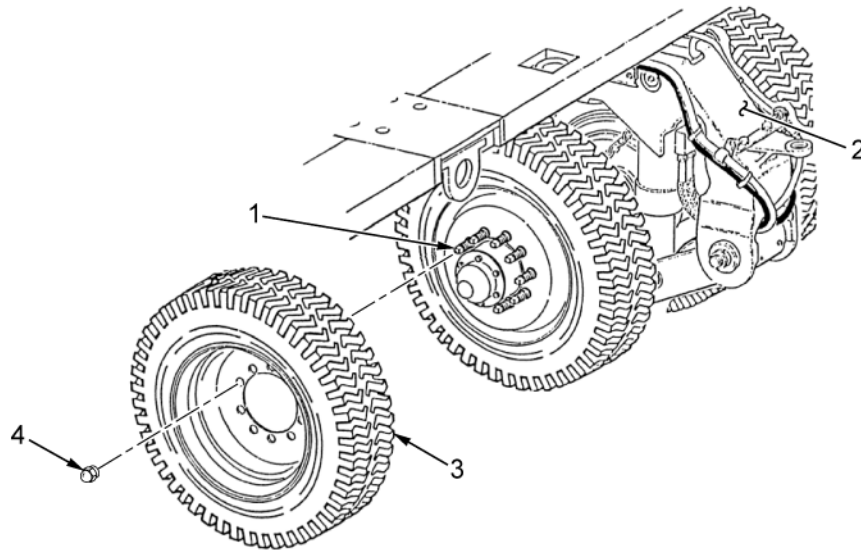
HETT0198

Figure 5. Removing Lug Nuts.

END OF TASK

INSTALLATION

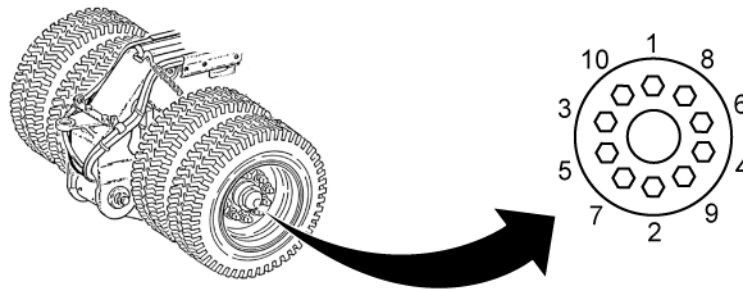
1. Start APU (WP 0005) if not running.
2. Inspect wheels for damage. Inspect stud holes for debris and clean if necessary.
3. Clean all threads on studs and nuts.
4. Align inner/outer wheel (Figure 6, Item 3) onto lug studs (Figure 6, Item 1) so that valve stem is 180 degrees opposite valve stem on inner wheel.
5. Install top and bottom lug nuts (Figure 6, Item 4) fingertight to seat wheel properly.
6. Install and hand-tighten eight remaining lug nuts (Figure 6, Item 4) and hand-tighten all ten lug nuts in sequence shown in Figure 7.
7. Lower platform (WP 0008) until all tires on affected bogie (Figure 6, Item 2) come in contact with the ground.



HETT0198

Figure 6. Tire Maintenance.

8. Use ratchet, 8 in. extension, and lug socket to continue to tighten lug nuts in sequence shown in Figure 7. Notify unit maintenance that lug nuts need to be torqued to 450 to 501 lb-ft (610 to 680 Nm). Torque in sequence shown in Figure 7.



HETT0813

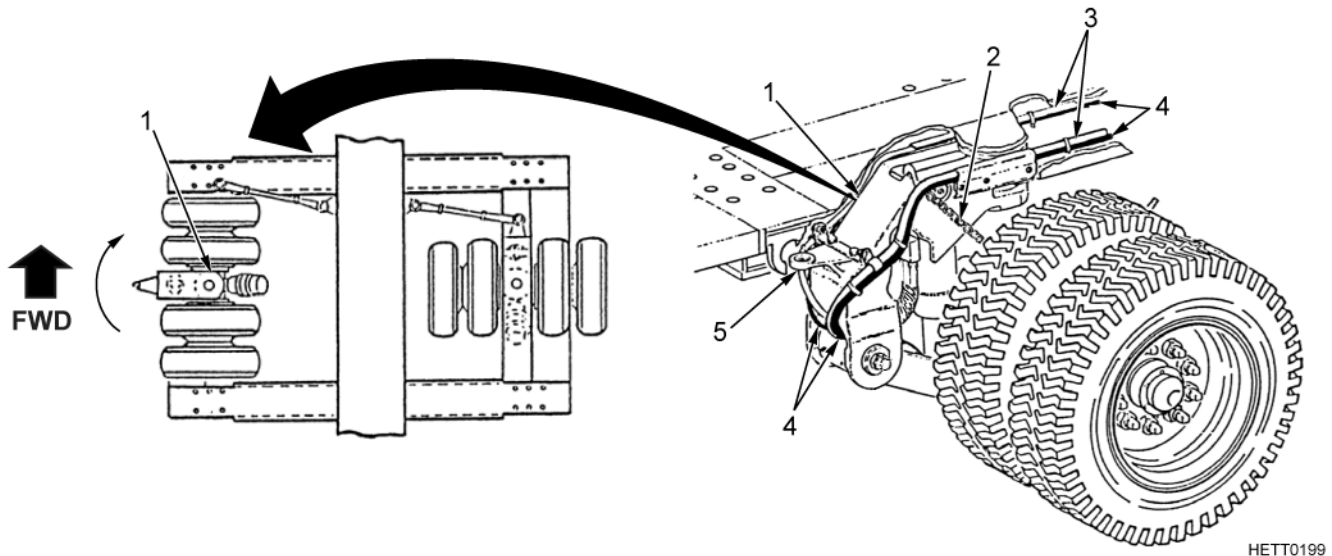
Figure 7. Tightening Sequence for Outer Dual Set.

9. Raise platform (WP 0008) until all tires on affected bogie (Figure 8, Item 1) are off ground.
10. Rotate bogie (Figure 8, Item 1) with suspension chain (Figure 8, Item 2) still attached and pull toward semitrailer gooseneck so that linkage attaching point (Figure 8, Item 5) faces forward.

CAUTION

Ensure that hydraulic and air brake lines are securely mounted on bogie or damage to equipment may result.

11. Check that two hydraulic lines (Figure 8, Item 4) and air brake lines (Figure 8, Item 3) are not chafed, broken, or missing any electrical tie-wraps at affected bogie (Figure 8, Item 1). If any defects exist or items are missing, notify unit maintenance.



HETT0199

Figure 8. Connecting Linkage Attaching Point.

12. Continue to move bogie (Figure 9, Item 3) as required until linkage attaching point on bogie is approximately aligned with connecting link (Figure 9, Item 1). Prying device (Figure 9, Item 4) may be used to help with alignment.
13. For no. 1 bogie only, align and install preformed packing (Figure 9, Item 5) onto bogie (Figure 9, Item 3).
14. Remove safety pin (Figure 9, Item 6) and nut (Figure 9, Item 7) from capscrew (Figure 9, Item 2). Align and install connecting link (Figure 9, Item 1) onto linkage attaching point on bogie (Figure 9, Item 3). Secure connecting link in place by installing capscrew and nut.
15. Use adjustable wrench, ratchet, and 1 1/8 in. socket to continue to tighten nut (Figure 9, Item 7) until hole in capscrew (Figure 9, Item 2) is aligned with slot in nut. Install safety pin (Figure 9, Item 6). Notify unit maintenance that nut needs to be torqued to a minimum of 205 lb-ft (278 Nm). Then, continue to tighten nut until first available slot is aligned with hole and safety pin can be installed.

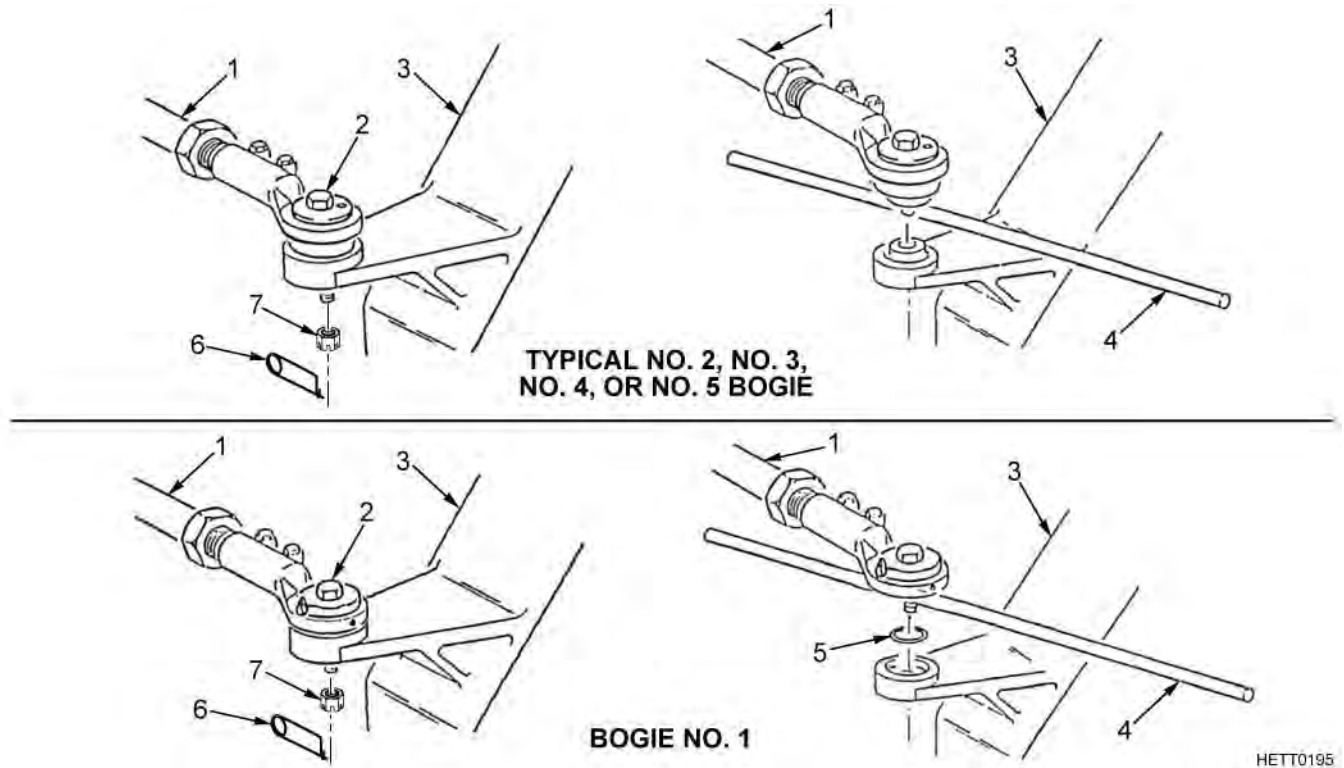


Figure 9. Installing Connecting Links.

16. Lower platform (WP 0008) until all tires on affected bogie touch ground.
17. Open valve handle (Figure 10, Item 2) on suspension isolation valve (Figure 10, Item 3) with handle facing inboard toward front of semitrailer at affected bogie (Figure 10, Item 1).
18. Continue to lower platform (WP 0008) until there is enough clearance to remove suspension chain (Figure 10, Item 4) from affected bogie (Figure 10, Item 1).

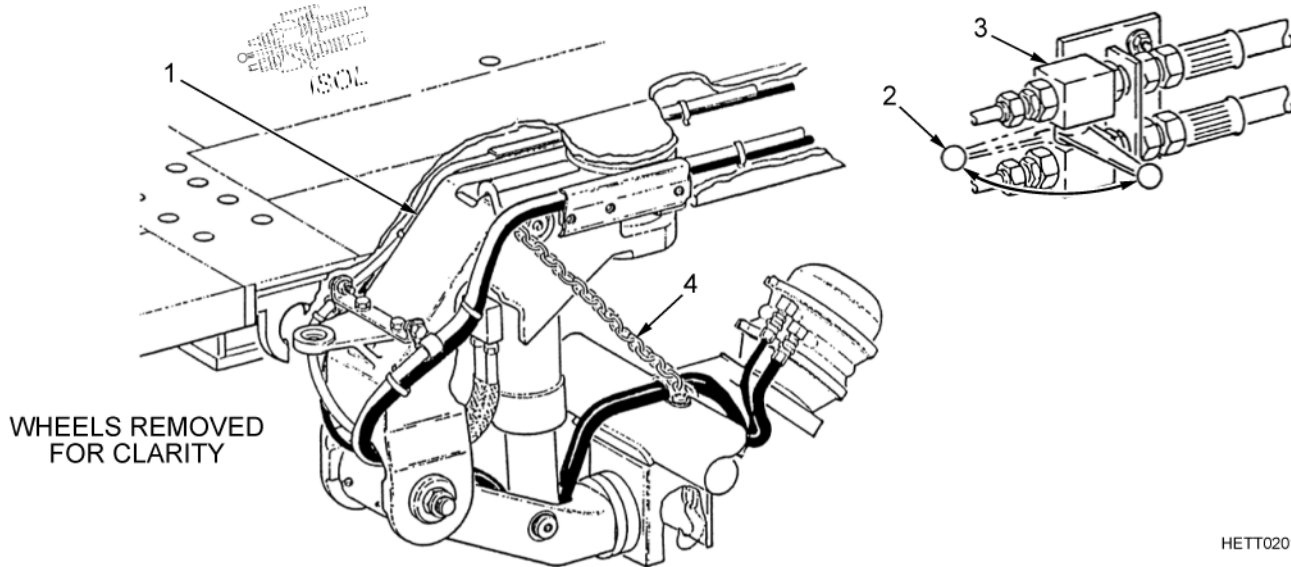


Figure 10. Suspension Isolation Valve.

19. Readjust platform height (WP 0008) to 43 in. (109 cm).
20. Shut down APU (WP 0005).
21. Restow all tools and equipment used during this procedure.

END OF TASK

FOLLOW-ON MAINTENANCE

Notify unit maintenance that wheel nuts and nut on outboard end of connecting link of affected bogie require torquing.

END OF WORK PACKAGE

FIELD MAINTENANCE**INNER/INNER WHEEL**

INITIAL SETUP:**Tools and Special Tools**

Standard Army Tool Set (WP 0168, Item 28)
Chain Assembly, 1/2 in., 11 in. L (WP 0168, Item 30)

Equipment Conditions

Inner/outer wheel removed (WP 0080)
Spare tire removed (WP 0077), if necessary

Personnel Required

2

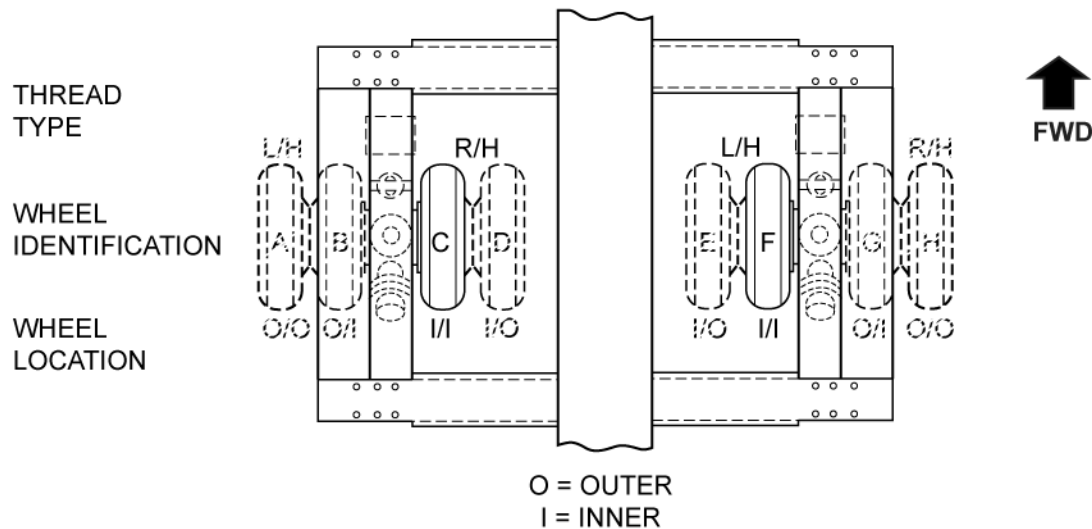
GENERAL INFORMATION

This work package contains instructions for the removal and installation of the inner/inner wheel.

REMOVAL

NOTE

Wheel removal/installation is divided into four separate procedures. Refer to the diagram in Figure 1 for location, wheel designation, and thread types. Within each procedure, notes will identify wheels and right-hand/left-hand lug nuts or lug studs.



HETT0202

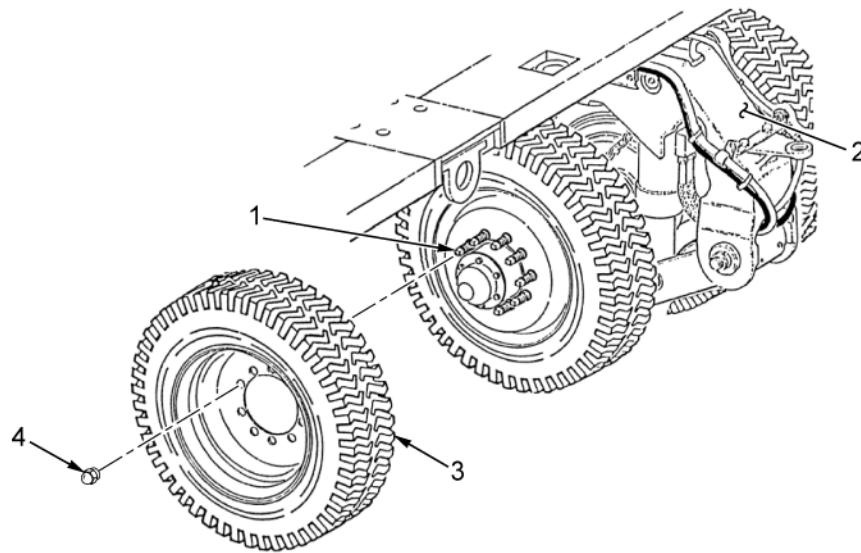
Figure 1. Tire/Wheel Identity.

1. Start and run Auxiliary Power Unit (APU) (WP 0005) if not running.
2. Lower platform (WP 0008) until all tires on affected bogie are on ground.

CAUTION

Use Figure 1 for identification purposes. Wheel F has left-hand threaded lug studs. Wheel C has right-hand threaded lug studs. During removal, use correct rotation for each type of thread or damage to lug studs and hub studs may result.

3. Use ratchet, 8 in. extension, metallic tube, and lug socket to loosen ten lug nuts (Figure 2, Item 4).
4. Raise platform (WP 0008) until all tires for affected bogie (Figure 2, Item 2) are off ground.
5. Remove ten lug nuts (Figure 2, Item 4) and inner/inner wheel (Figure 2, Item 3) from studs (Figure 2, Item 1) on affected bogie (Figure 2, Item 2). Clean lug studs and studs.
6. Let APU run to charge battery if other tire maintenance is to be performed.



HETT0198

Figure 2. Removal of Inner/Inner Wheel.

END OF TASK

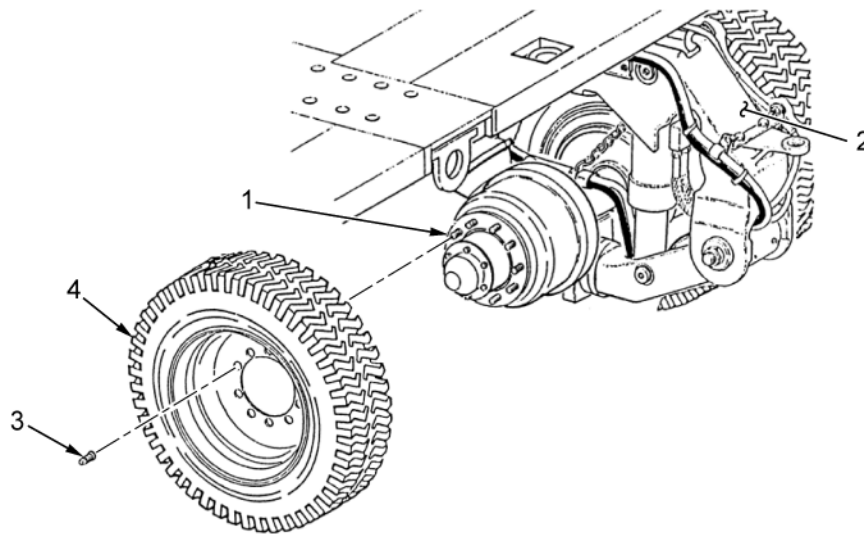
INSTALLATION

1. Align and install inner/inner wheel (Figure 3, Item 4) onto hub studs (Figure 3, Item 1) at affected bogie (Figure 3, Item 2).

CAUTION

Use Figure 1 for identification purposes. Wheel B has left-hand threaded lug studs. Wheel G has right-hand threaded lug studs. Use correct rotation for each type thread or damage to lug studs and hub studs may result.

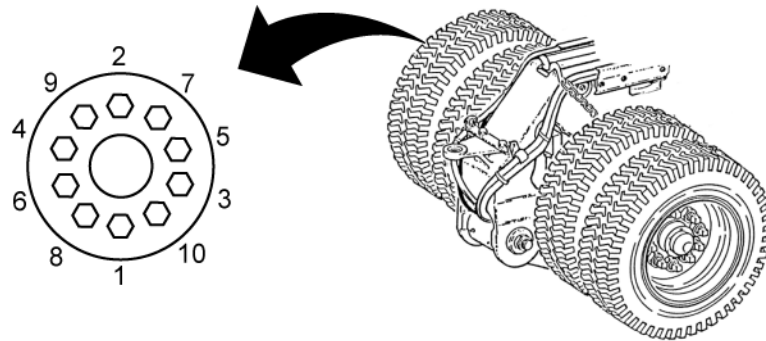
2. Use ratchet, 8 in. extension, and lug socket to install ten lug studs (Figure 3, Item 3) onto hub studs (Figure 3, Item 1) in sequence shown in Figure 4.



HETT0203

Figure 3. Installation of Inner/Inner Wheel.

3. Start and run APU (WP 0005) if not running.
4. Lower platform (WP 0008) until all tires on affected bogie come in contact with the ground.
5. Use ratchet, 8 in. extension, and lug socket to continue to tighten lug studs in sequence shown in Figure 4. Notify unit maintenance that lug studs need to be torqued to 450 to 500 lb-ft (610 to 680 Nm). Torque in sequence shown in Figure 4.



HETT0814

Figure 4. Tightening Sequence for Inner Dual Tire Set.

6. Raise platform (WP 0008) until all tires for affected bogie are off the ground.

END OF TASK

FOLLOW-ON MAINTENANCE

Install inner/outer wheel (WP 0080).

Notify unit maintenance that wheels on affected bogie require torquing.

END OF WORK PACKAGE

FIELD MAINTENANCE**CONNECTING LINK**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Kit, Ultra Bushing Rem/Instl (WP 0168, Item 19)
Standard Army Tool Set (WP 0168, Item 28)

Nonmetallic Seal (2)

Wood Block, 12 in. x 12 in. (4)

Personnel Required

1

Materials/Parts

Crocus Cloth, Abrasive (WP 0170, Item 6)
Grease (WP 0170, Item 16)
Solvent, Cleaning Compound (WP 0170, Item 31)
Locknut (8)
Preformed Packing (5)
Cotter Pin (2)

Equipment Conditions

Platform adjusted to 50 in. (127 cm) height (WP 0008)
Front and rear support legs lowered onto wood blocks supporting platform (WP 0011 and WP 0012)
For connecting links attached to no. 5 steering plate only, manually adjust steering for a one-half left turn (WP 0010)

GENERAL INFORMATION

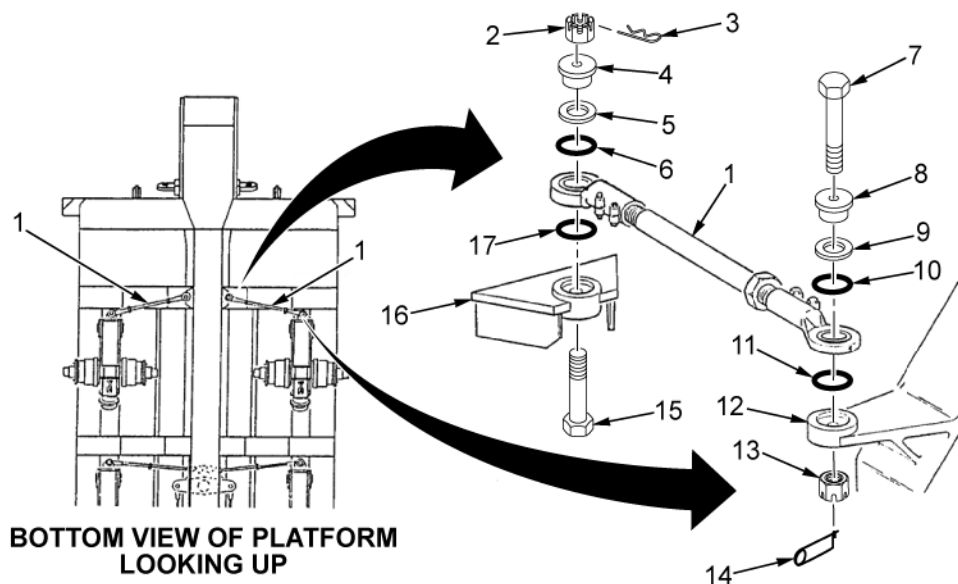
This work package contains instructions for removal, repair, installation, and urethane bushing repair for the connecting link.

REMOVAL

NOTE

There are ten connecting links. The two non-steerable connecting links connect the no. 1 bogies to a rigid platform mount. The remaining eight connecting links connect steerable bogies no. 2 thru no. 5 to their respective steering plates. To remove a non-steerable connecting link, perform steps 1 thru 6 below. To remove a steerable connecting link, perform steps 7 thru 11 below.

1. Remove special pin (Figure 1, Item 14) from slotted nut (Figure 1, Item 13). Use 3/4 in. ratchet, 1 1/8 in. socket, and 1 1/8 in. combination wrench to remove slotted nut and capscrew (Figure 1, Item 7) from upper suspension arm (Figure 1, Item 12) and connecting link (Figure 1, Item 1).
2. Use pry bar to pry end of connecting link (Figure 1, Item 1) up and out of linkage attaching point on upper suspension arm (Figure 1, Item 12). Remove preformed packing (Figure 1, Item 11) from linkage attaching point. Discard preformed packing.
3. Remove sleeve bushing (Figure 1, Item 8), ring spacer (Figure 1, Item 9), and preformed packing (Figure 1, Item 10) from connecting link (Figure 1, Item 1). Discard preformed packing.
4. Remove cotter pin (Figure 1, Item 3) from slotted nut (Figure 1, Item 2). Use 3/4 in. ratchet, 1 1/8 in. socket, and 1 1/8 in. combination wrench to remove slotted nut and capscrew (Figure 1, Item 15) from connecting link (Figure 1, Item 1) and rigid platform mount (Figure 1, Item 16). Discard cotter pin.
5. Use pry bar to pry end of connecting link (Figure 1, Item 1) up and out of linkage attaching point on rigid platform mount (Figure 1, Item 16). Remove preformed packing (Figure 1, Item 17) from linkage attaching point. Discard preformed packing.
6. Remove sleeve bushing (Figure 1, Item 4), ring spacer (Figure 1, Item 5), and preformed packing (Figure 1, Item 6) from connecting link (Figure 1, Item 1). Discard preformed packing.



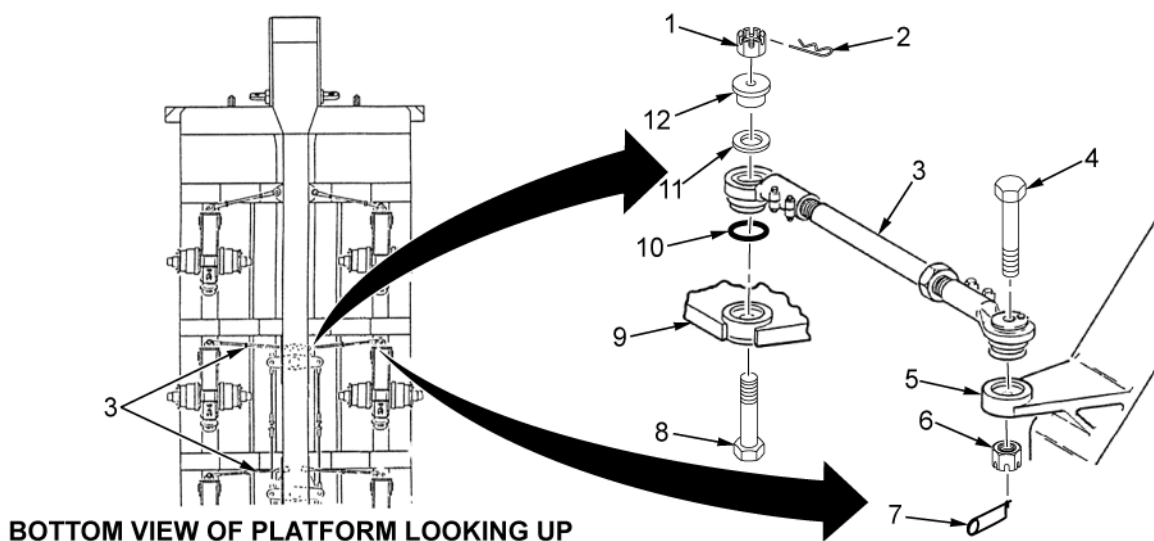
HETT0385

Figure 1. Typical Non-Steerable Connecting Link.

NOTE

Removal procedures for the eight steerable bogie connecting links are the same except for no. 5 bogie. Ensure the steering plate is set for a one-half left turn or there will not be enough room between the no. 5 steering plate and platform steering cylinders to remove the steering plate connecting link bolt.

7. Remove special pin (Figure 2, Item 7) from slotted nut (Figure 2, Item 6). Use 3/4 in. ratchet, 1 1/8 in. socket, and 1 1/8 in. combination wrench to remove slotted nut and capscrew (Figure 2, Item 4) from upper suspension arm (Figure 2, Item 5) and steerable connecting link (Figure 2, Item 3).
8. Use pry bar to pry end of connecting link (Figure 2, Item 3) up and out of linkage attaching point on upper suspension arm (Figure 2, Item 5).
9. Remove cotter pin (Figure 2, Item 2) from slotted nut (Figure 2, Item 1). Use 3/4 in. ratchet, 1 1/8 in. socket, and 1 1/8 in. combination wrench to remove slotted nut and capscrew (Figure 2, Item 8) from connecting link (Figure 2, Item 3) and steering plate (Figure 2, Item 9). Discard cotter pin.
10. Use pry bar to pry end of connecting link (Figure 2, Item 3) up and out of linkage attaching point on steering plate (Figure 2, Item 9). Remove preformed packing (Figure 2, Item 10) from steering plate. Discard preformed packing.
11. Remove sleeve bushing (Figure 2, Item 12) and ring spacer (Figure 2, Item 11) from connecting link (Figure 2, Item 3).



HETT0386

Figure 2. Typical Steerable Connecting Link.

END OF TASK

REPAIR**NOTE**

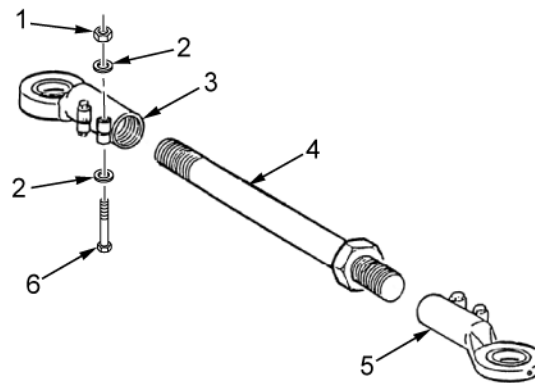
Perform only the steps necessary to disassemble a connecting link to the point required for repair. To disassemble a non-steerable connecting link, perform steps 1 and 2. To disassemble a steerable connecting link, perform steps 3 thru 5.

1. Remove two locknuts (Figure 3, Item 1), four washers (Figure 3, Item 2), and two capscrews (Figure 3, Item 6) from each rod end (Figure 3, Item 3 and Item 5). Discard locknuts.

NOTE

When removing the rod ends from the connecting link rod, count and document the number of turns required to unscrew each rod. This recorded information will be required during assembly of the connecting link assembly.

2. Place rigid link (Figure 3, Item 4) in machinist's vise and, using adjustable automotive wrench while counting turns, unscrew and remove rod ends (Figure 3, Item 3 and Item 5) from rigid link. Remove rigid link from vise.



HETT0387

Figure 3. Disassembly of Non-Steerable Connecting Link.

NOTE

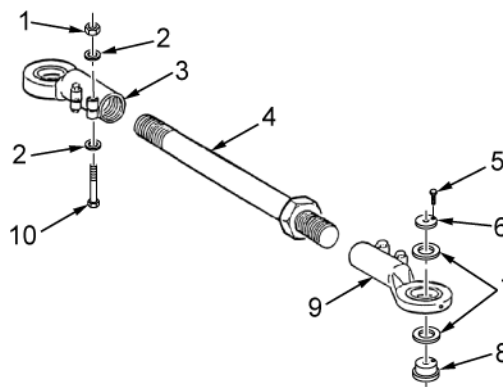
To disassemble any of the eight steerable connecting link assemblies, perform steps 3 thru 5.

3. Remove screw (Figure 4, Item 5), retaining ring (Figure 4, Item 6), two nonmetallic seals (Figure 4, Item 7), and shouldered pin (Figure 4, Item 8) from rod ends (Figure 4, Item 3 and Item 9). Discard nonmetallic seals.
4. Remove two locknuts (Figure 4, Item 1), four washers (Figure 4, Item 2), and two capscrews (Figure 4, Item 10) from rod ends (Figure 4, Item 3 and Item 9). Discard locknuts.

NOTE

When removing the rod ends from the connecting link rod, count and document the number of turns required to unscrew each rod. This recorded information will be required during assembly of the connecting link assembly.

5. Secure rigid link (Figure 4, Item 4) in machinist's vise and, using adjustable automotive wrench while counting turns, unscrew and remove rod ends (Figure 4, Item 9 and Item 3) from rigid link. Remove rigid link from vise.



HETT0388

Figure 4. Disassembly of Steerable Connecting Link.

WARNING

....."UQNXGPV'ENGCPPI 'EQO RQWPF 'FTI 'ENGCPPI 'UQNXGPV+

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
- The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound.
- Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.

Failure to follow these warnings may result in injury or death to personnel.

6. Clean all parts removed in degreaser tank with cleaning compound solvent and wire brush as necessary. Remove any nicks, burrs, or corrosion from polished surfaces using crocus cloth.
7. Inspect all parts removed for broken welds, nicks, burrs, pitting, and scoring. Clean parts as required and replace any parts found defective.
8. Inspect sleeve bushing in both ends of connecting link for worn/distorted urethane. If urethane is worn/distorted, replace sleeve bushing.

WARNING

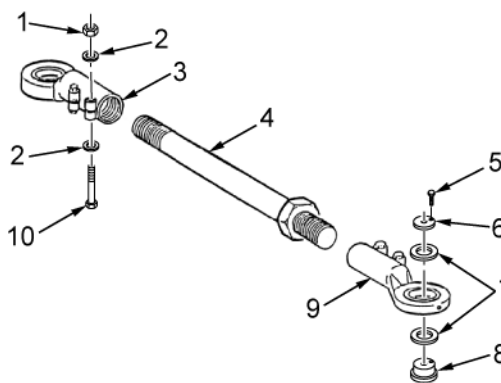
- Adhesives, solvents, and sealing compounds may burn easily, may give off harmful vapors, and are harmful to skin and clothing. Keep away from open flames and use in well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.
- On direct contact, uncured silicone sealant irritates eyes. In case of contact, flush eyes with water and seek medical attention. In case of skin contact, wipe off and flush with water.

Failure to follow these warnings may result in injury or death to personnel.

NOTE

To assemble steerable connecting link, perform steps 9 thru 11. To assemble a non-steerable connecting link, perform steps 12 and 13.

9. Apply thin coat of grease to threaded ends of rigid link (Figure 5, Item 4). Secure rigid link in machinist's vise and, using adjustable automotive wrench, align and install rod ends (Figure 5, Item 3 and Item 9) onto rigid link, threading each rod end the number of turns recorded during disassembly.
10. Secure each rod end (Figure 5, Item 3 and Item 9) in place by installing two capscrews (Figure 5, Item 10), four washers (Figure 5, Item 2), and two locknuts (Figure 5, Item 1). Remove rigid link from machinist's vise.
11. Apply thin coat of grease to two nonmetallic seals (Figure 5, Item 7) and apply thin coat of grease to wear surfaces of shoulder pin (Figure 5, Item 8). Install shoulder pin, two nonmetallic seals (Figure 5, Item 7), retaining ring (Figure 5, Item 6), and screw (Figure 5, Item 5) onto rod end (Figure 5, Item 9).



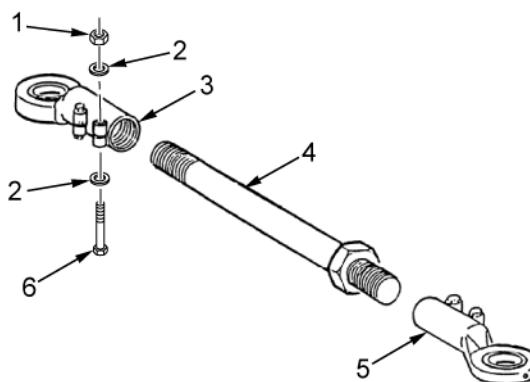
HETT0388

Figure 5. Assembly of Steerable Connecting Link.

NOTE

To assemble non-steerable connecting link, perform steps 12 and 13.

12. Apply thin coat of grease to threaded ends of rigid link (Figure 6, Item 4). Secure rigid link in machinist's vise and, using adjustable automotive wrench, align and install rod ends (Figure 6, Item 5 and Item 3) onto rigid link, threading each rod end the number of turns recorded during disassembly.
13. Secure each rod end (Figure 6, Item 5 and Item 3) in place by installing two capscrews (Figure 6, Item 6), four washers (Figure 6, Item 2), and two locknuts (Figure 6, Item 1). Remove rigid link (Figure 6, Item 4) from machinist's vise.



HETT0387

Figure 6. Assembly of Non-steerable Connecting Link.

END OF TASK

INSTALLATION

WARNING



- Adhesives, solvents, and sealing compounds may burn easily, may give off harmful vapors, and are harmful to skin and clothing. Keep away from open flames and use in well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.
- On direct contact, uncured silicone sealant irritates eyes. In case of contact, flush eyes with water and seek medical attention. In case of skin contact, wipe off and flush with water.

Failure to follow these warnings may result in injury or death to personnel.

NOTE

Installation procedures for the eight steerable bogie connecting links are the same except for no. 5 bogie. Ensure the no. 5 steering plate is set for a one-half left turn or there will not be enough room to install the connecting link bolt between the steering cylinder and steering plate. To install a steerable connecting link, perform steps 1 thru 6. To install a non-steerable connecting link, perform steps 7 thru 14.

1. Lubricate preformed packing (Figure 7, Item 10) with grease and install preformed packing under connecting link (Figure 7, Item 3) rod end at linkage attaching point on steering plate (Figure 7, Item 9).
2. Apply thin coat of grease to wear surfaces of sleeve bushing (Figure 7, Item 12). Install ring spacer (Figure 7, Item 11) and sleeve bushing onto connecting link (Figure 7, Item 3). Install capscrew (Figure 7, Item 8) from underside, through connecting link rod end and steering plate (Figure 7, Item 9).

NOTE

Torque wrench and socket should be used to hold capscrew. Combination wrench should be used to hold slotted nut when applying final torque to connecting link attaching hardware.

3. Install slotted nut (Figure 7, Item 1) onto capscrew (Figure 7, Item 8). Use torque wrench, 1 1/8 in. socket, and 1 1/8 in. combination wrench to torque slotted nut to 205 lb-ft (278 Nm). Tighten slotted nut additionally, as required, to align first available slot with hole in shank of capscrew and install cotter pin (Figure 7, Item 2).
4. Position connecting link (Figure 7, Item 3) rod end at linkage attaching point on upper suspension arm (Figure 7, Item 5).
5. Install capscrew (Figure 7, Item 4) from topside through rod end of link assembly (Figure 7, Item 3) and upper suspension arm (Figure 7, Item 5).

NOTE

Torque wrench and socket should be used to hold capscrew. Combination wrench should be used to hold slotted nut when applying final torque to connecting link attaching hardware.

6. Install slotted nut (Figure 7, Item 6) onto capscrew (Figure 7, Item 4). Use torque wrench, 1 1/8 in. socket, and 1 1/8 in. combination wrench to torque slotted nut to 205 lb-ft (278 Nm). Tighten slotted nut additionally, as required, to align first available slot with hole in shank of capscrew and install special pin (Figure 7, Item 7).

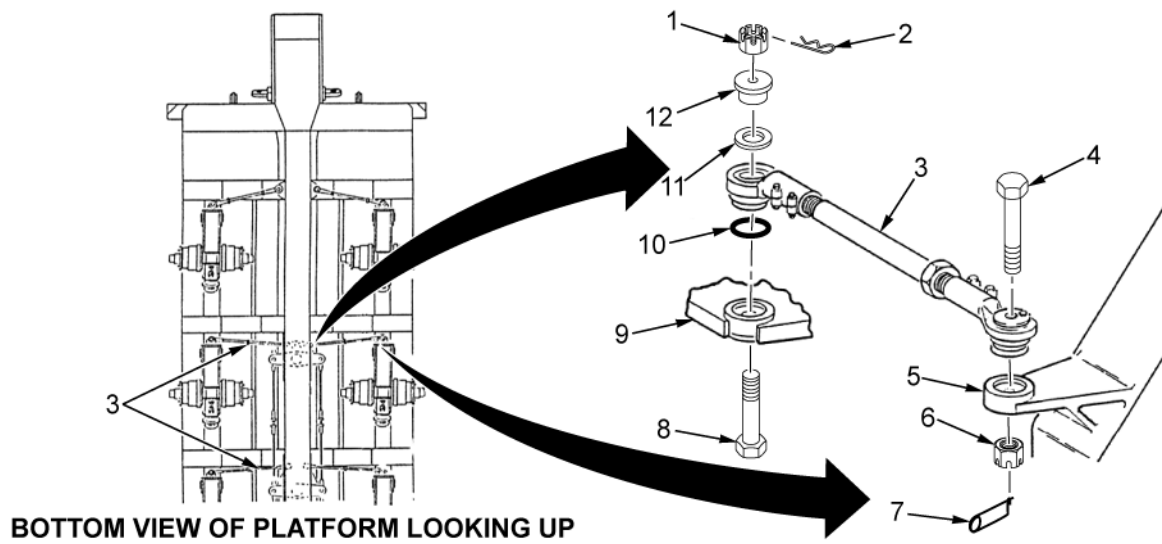


Figure 7. Installation Typical Steerable Connecting Link.

NOTE

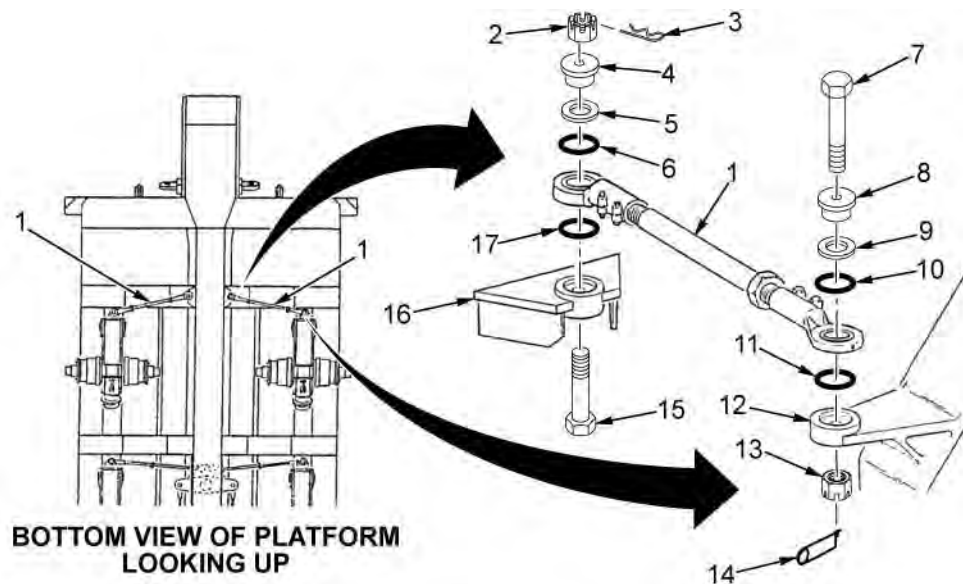
To install a non-steerable connecting link, perform steps 7 thru 14.

7. Lubricate preformed packing (Figure 8, Item 17) with grease and install preformed packing under connecting link (Figure 8, Item 1) rod end at linkage attaching point on fixed platform mount (Figure 8, Item 16).
8. Lubricate preformed packing (Figure 8, Item 6) with grease and apply thin coat of grease to wear surfaces of sleeve bushing (Figure 8, Item 4). Install preformed packing with ring spacer (Figure 8, Item 5) and sleeve bushing.
9. Install capscrew (Figure 8, Item 15) from underside through connecting link (Figure 8, Item 1) rod end and rigid platform mount (Figure 8, Item 16).

NOTE

Torque wrench and socket should be used to hold capscrew. Combination wrench should be used to hold slotted nut when applying final torque to connecting link attaching hardware.

10. Install slotted nut (Figure 8, Item 2) onto capscrew (Figure 8, Item 15). Use torque wrench, 1 1/8 in. socket, and 1 1/8 in. combination wrench to torque slotted nut to 205 lb-ft (278 Nm). Tighten slotted nut additionally, as required, to align first available slot with hole in shank of capscrew and install cotter pin (Figure 8, Item 3).
11. Lubricate preformed packing (Figure 8, Item 11) with grease and install preformed packing under connecting link (Figure 8, Item 1) rod end at linkage attaching point on upper suspension arm (Figure 8, Item 12).
12. Lubricate preformed packing (Figure 8, Item 10) with grease and apply thin coat of grease to wear surfaces of sleeve bushing (Figure 8, Item 8). Install preformed packing with ring spacer (Figure 8, Item 9) and sleeve bushing.
13. Install capscrew (Figure 8, Item 7) from topside through rod end of link assembly (Figure 8, Item 1) and upper suspension arm (Figure 8, Item 12).
14. Install slotted nut (Figure 8, Item 13) onto capscrew (Figure 8, Item 7). Use torque wrench, 1 1/8 in. socket, and 1 1/8 in. combination wrench to torque slotted nut to 205 lb-ft (278 Nm). Tighten slotted nut additionally, as required, to align first available slot with hole in shank of capscrew and install special pin (Figure 8, Item 14).



HETT0385

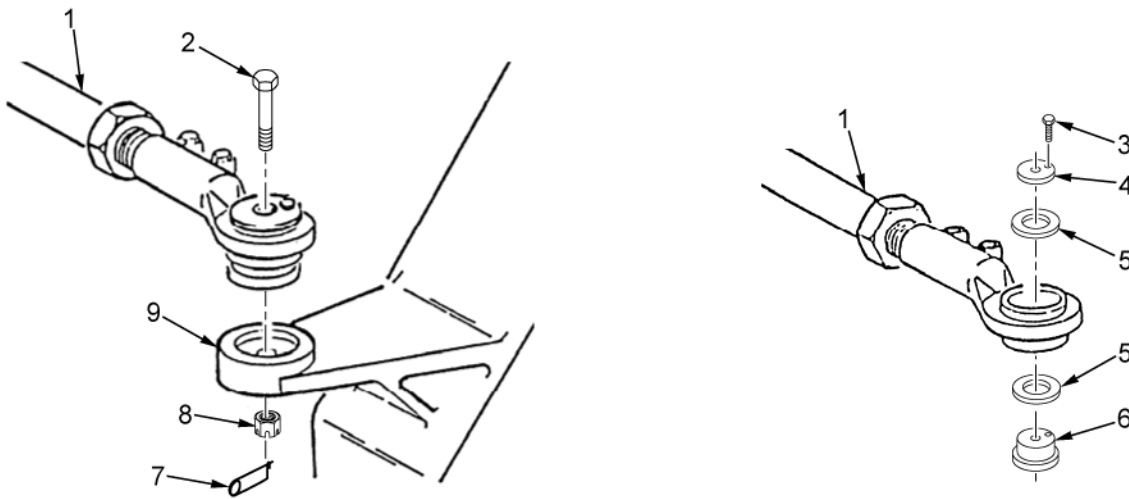
Figure 8. Installation of Typical Non-Steerable Connecting Link.

END OF TASK

URETHANE BUSHING REPAIR**NOTE**

This task is for the removal of the outboard urethane bushing on outboard end of connecting links for bogies no. 2, no. 3, no. 4, and no. 5.

1. If connecting link is already removed, proceed to step 6. If connecting link is connected to bogie, proceed with steps 2 through 5.
2. Adjust platform (WP 0008) to 50 in. height (127 cm).
3. Close suspension isolation valves (WP 0004) at four corners of platform, handles facing outward.
4. Remove special pin (Figure 9, Item 7), slotted nut (Figure 9, Item 8), and capscrew (Figure 9, Item 2) from connecting link (Figure 9, Item 1).
5. Pry up and move connecting link (Figure 9, Item 1) from upper suspension arm (Figure 9, Item 9) on bogie.
6. Remove screw (Figure 9, Item 3), retaining ring (Figure 9, Item 4), two nonmetallic seals (Figure 9, Item 5), and shouldered pin (Figure 9, Item 6) from connecting link (Figure 9, Item 1). Discard nonmetallic seals.



HETT0392

Figure 9. Urethane Bushing Removal.

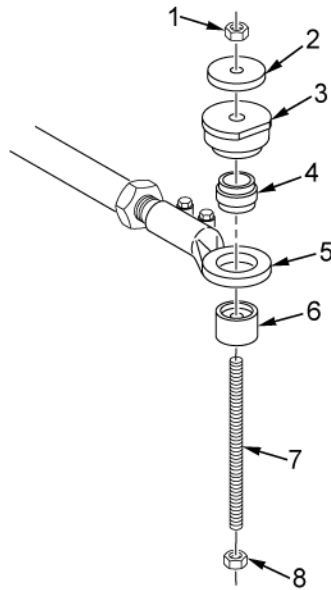
7. Center bushing cap (Figure 10, Item 3) and washer (Figure 10, Item 2) over urethane bushing (Figure 10, Item 4) on connecting link (Figure 10, Item 5).
8. Install threaded rod (Figure 10, Item 7) up through bottom of urethane bushing (Figure 10, Item 4) and through bushing cap (Figure 10, Item 3) and washer (Figure 10, Item 2).
9. Install nut (Figure 10, Item 1) onto top of threaded rod (Figure 10, Item 7). Thread nut until approximately three threads of threaded rod protrude past end of nut.
10. Install spacer (Figure 10, Item 6), with recessed side facing upward, onto threaded rod (Figure 10, Item 7) from under side of connecting link (Figure 10, Item 5).
11. Install nut (Figure 10, Item 8) onto threaded rod (Figure 10, Item 7). Tighten nut against spacer (Figure 10, Item 6).
12. Center bushing cap (Figure 10, Item 3) and spacer (Figure 10, Item 6) over urethane bushing (Figure 10, Item 4) on connecting link (Figure 10, Item 5).
13. Use 3/4 in. ratchet, 1 1/8 in. socket, and 1 1/8 in. combination wrench to tighten nuts (Figure 10, Item 1 and Item 8). Continue to tighten nuts until urethane bushing (Figure 10, Item 4) is removed from connecting link (Figure 10, Item 5).
14. Remove tool from connecting link (Figure 10, Item 5). Remove nut (Figure 10, Item 8), spacer (Figure 10, Item 6), and urethane bushing (Figure 10, Item 4) from threaded rod (Figure 10, Item 7). Discard urethane bushing.

CAUTION

Urethane bushing is not symmetrical. One side has more urethane material protruding beyond the outer steel sleeve. Ensure that the side with the most material is pointing downward.

15. Insert new urethane bushing (Figure 10, Item 4) into opening on top of connecting link (Figure 10, Item 5). Install spacer (Figure 10, Item 6) over urethane bushing. Ensure spacer is properly seated onto urethane bushing.
16. Turn threaded rod (Figure 10, Item 7) over so that bushing cap (Figure 10, Item 3) and washer (Figure 10, Item 2) are held in place by nut (Figure 10, Item 1).
17. Install threaded rod (Figure 10, Item 7) up through connecting link (Figure 10, Item 5), urethane bushing (Figure 10, Item 4), and spacer (Figure 10, Item 6). Install nut (Figure 10, Item 8) onto threaded rod so that approximately three threads of threaded rod protrude past end of nut.
18. Center bushing tool onto urethane bushing (Figure 10, Item 4) and opening of connecting link (Figure 10, Item 5). Tighten nut (Figure 10, Item 1).

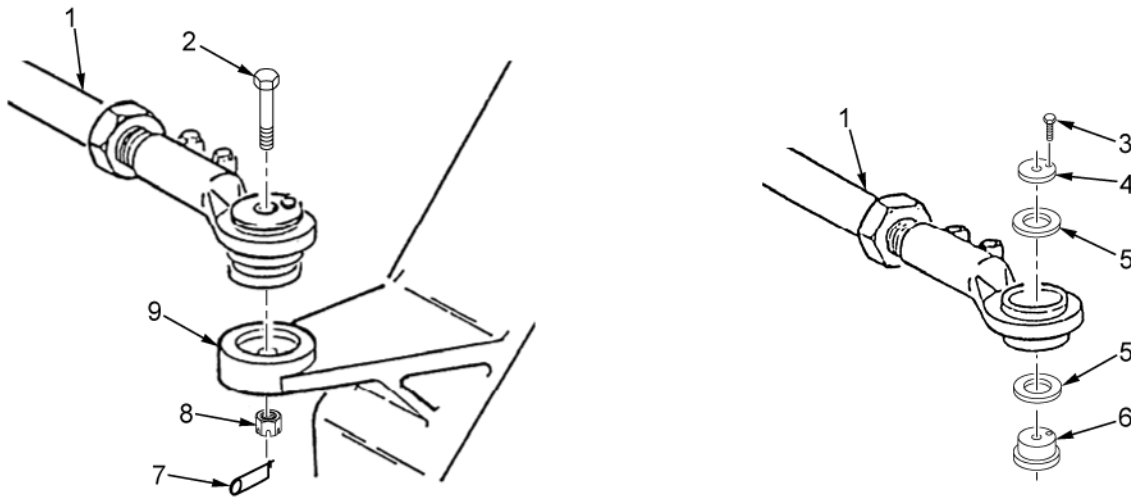
19. Use 3/4 in. ratchet, 1 1/8 in. socket, and 1 1/8 in. combination wrench to tighten nuts (Figure 10, Item 1 and Item 8). Continue to tighten nuts until urethane bushing (Figure 10, Item 4) is centered in top and bottom of connecting link (Figure 10, Item 5).
20. Remove nuts (Figure 10, Item 1 and Item 8) from threaded rod (Figure 10, Item 7) and remove pieces of bushing tool.



HETT0393

Figure 10. Urethane Bushing.

21. Install shouldered pin (Figure 11, Item 6), two nonmetallic seals (Figure 11, Item 5), and retaining ring (Figure 11, Item 4) onto connecting link (Figure 11, Item 1), and secure with screw (Figure 11, Item 3).
22. If connecting link (Figure 11, Item 1) was removed, refer to installation procedure and install connecting link. If connecting link was disconnected from bogie, proceed with steps 23 through 25.
23. Position connecting link (Figure 11, Item 1) onto upper suspension arm (Figure 11, Item 9).
24. Install capscrew (Figure 11, Item 2) through connecting link (Figure 11, Item 1) and upper suspension arm (Figure 11, Item 9). Install slotted nut (Figure 11, Item 8) onto capscrew.
25. Use torque wrench, 1 1/8 in. socket, and 1 1/8 in. combination wrench to torque slotted nut (Figure 11, Item 8) to 205 to 225 lb-ft (278 to 305 Nm). Tighten nut additionally, as required, to align nut with hole in shank of capscrew (Figure 11, Item 2). Install special pin (Figure 11, Item 7) into capscrew.



HETT0395

Figure 11. Urethane Bushing Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Perform required lubrication (WP 0163).

Perform platform steering alignment (WP 0038).

END OF WORK PACKAGE

FIELD MAINTENANCE

LONGITUDINAL STRUT

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Wood Block, 12 in. x 12 in. (4)
Special Bolt, Self-Locking (2)

Materials/Parts

Crocus Cloth, Abrasive (WP 0170, Item 6)
Grease (WP 0170, Item 16)
Sealing Compound Thread Locking (WP 0170, Item 25)
Solvent, Cleaning Compound (WP 0170, Item 31)
Lockwasher (1)
Packing Retainer (6)

Personnel Required

2

Equipment Conditions

Semitrailer parked on level ground (WP 0014)
Platform adjusted to 50 in. (127 cm) height (WP 0008)
Parking brakes applied and wheels chocked (WP 0013)
Front and rear support legs lowered onto wood blocks supporting platform (WP 0011 and WP 0012)

GENERAL INFORMATION

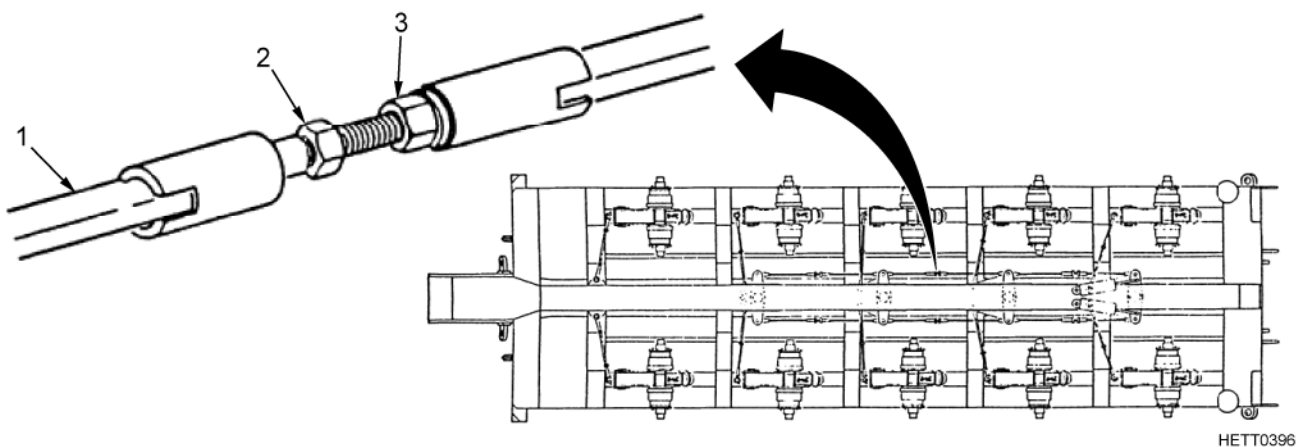
This work package contains instructions for removal, repair, and installation of the longitudinal strut.

REMOVAL

NOTE

Loosening the adjusting nut on the longitudinal strut relieves tension on both end pin assemblies and allows for easier removal.

1. Use adjustable automotive wrench at center of longitudinal strut (Figure 1, Item 1), and loosen nut (Figure 1, Item 3) two full turns. Then, loosen adjusting nut (Figure 1, Item 2) one and one-half turns counterclockwise.



HETT0396

Figure 1. Typical - All Struts Longitudinal Removal.

NOTE

Four ends of the six longitudinal struts that attach to steering plates no. 2 and no. 5 are identical. Perform steps 2 thru 5 to remove one end of a longitudinal strut from no. 2 or no. 5 steering plate.

2. Remove lubrication fitting (Figure 2, Item 7) and special bolt (Figure 2, Item 6) from sleeve bushing (Figure 2, Item 5). Discard special bolt.
3. Remove sleeve bushing (Figure 2, Item 5) from steering plate (Figure 2, Item 4). Remove packing retainer (Figure 2, Item 2) from sleeve bushing. Discard packing retainer.
4. Remove pin assembly (Figure 2, Item 1) from steering plate (Figure 2, Item 4) and longitudinal strut (Figure 2, Item 3).
5. Remove packing retainer (Figure 2, Item 2) from pin assembly (Figure 2, Item 1). Discard packing retainer.

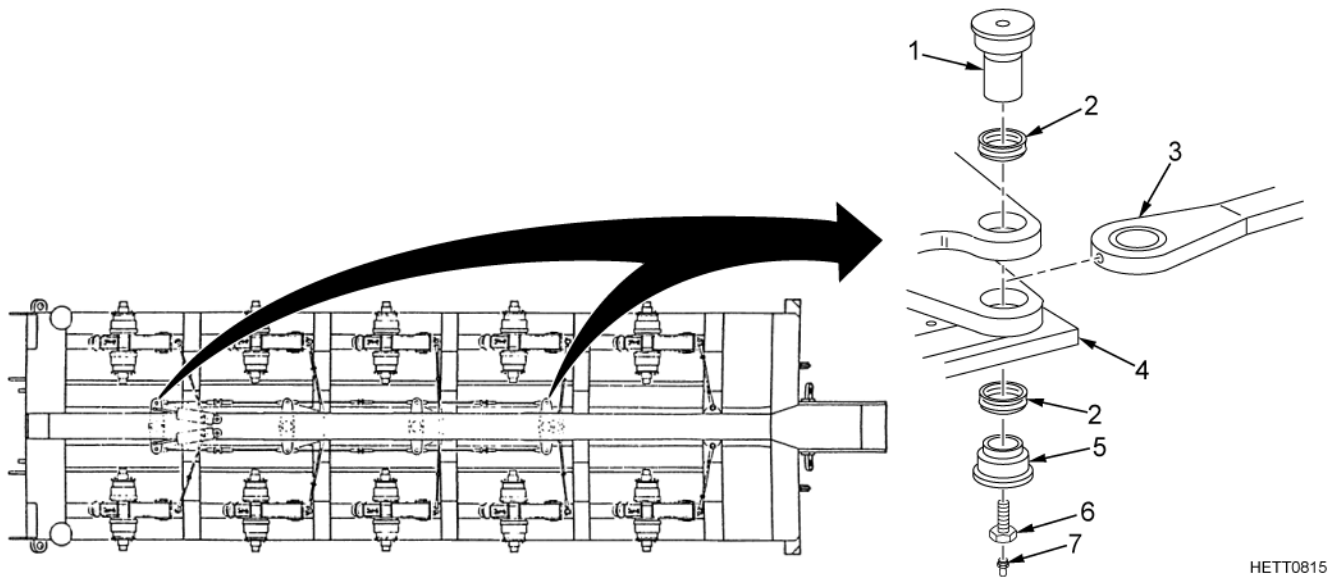


Figure 2. Longitudinal Strut from No. 2 or No. 5 Steering Plate Removal.

NOTE

Eight ends of the six longitudinal struts that attach to steering plates on bogies no. 3 and no. 4 are identical. Perform steps 6 thru 11 to remove one end of a longitudinal strut from no. 3 or no. 4 steering plate.

6. Remove lubrication fitting (Figure 3, Item 1) and special bolt (Figure 3, Item 8) from sleeve bushing (Figure 3, Item 7). Discard special bolt.
7. Remove sleeve bushing (Figure 3, Item 7) from steering plate (Figure 3, Item 9). Remove packing retainer (Figure 3, Item 3) from sleeve bushing. Discard packing retainer.
8. Remove pin assembly (Figure 3, Item 2) from steering plate (Figure 3, Item 9) and longitudinal strut (Figure 3, Item 4).
9. Remove packing retainer (Figure 3, Item 3) and lubrication fitting (Figure 3, Item 1) from pin assembly (Figure 3, Item 2). Discard packing retainer.
10. Use two people to pull ends of both longitudinal struts (Figure 3, Item 4) out and away from steering plate (Figure 3, Item 9).
11. Separate two longitudinal struts (Figure 3, Item 4) and remove spacer sleeve (Figure 3, Item 6) and two packing retainers (Figure 3, Item 5) from between longitudinal struts. Discard two packing retainers.

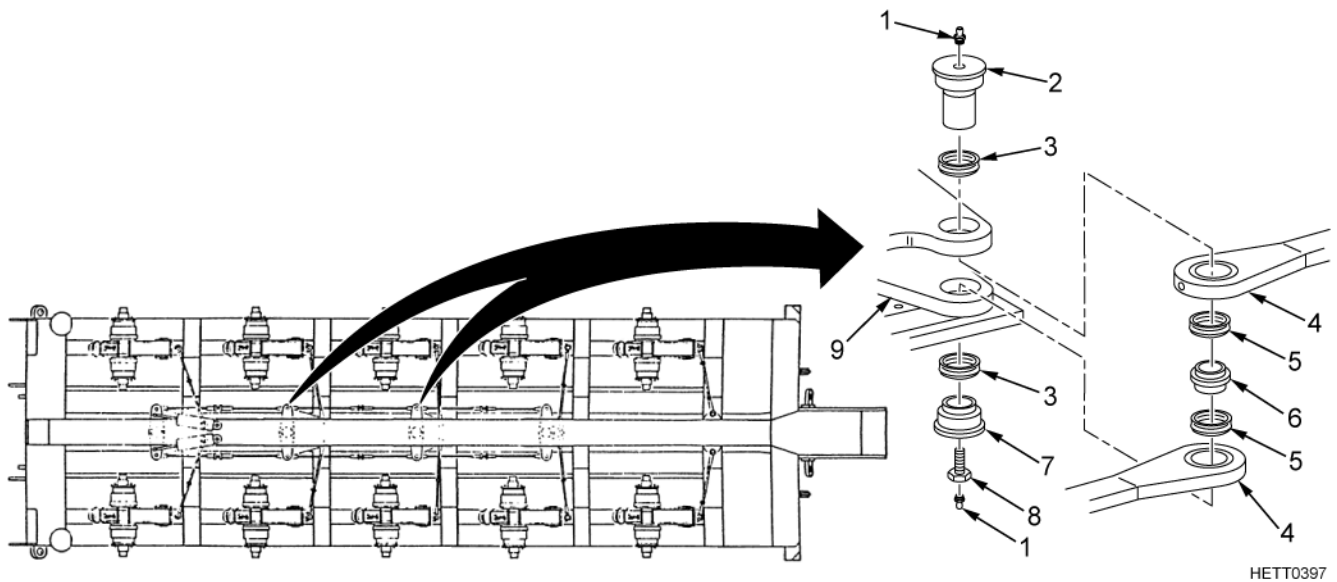


Figure 3. Typical at No. 3 and No. 4 Steering Plates.

END OF TASK

REPAIR

1. If applicable, remove setscrew (Figure 4, Item 1) from each end of longitudinal strut (Figure 4, Item 7).
2. Use hammer and brass drift to drive two plain bearings (Figure 4, Item 2) from longitudinal strut (Figure 4, Item 7).
3. Use adjustable automotive wrench to unscrew, count, and document number of turns required, and to separate two machined sockets (Figure 4, Item 6 and Item 3).
4. Remove lockwasher (Figure 4, Item 5) and nut (Figure 4, Item 4) from machined socket (Figure 4, Item 3). Discard lockwasher.

WARNING**SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
- The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound.
- Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.

Failure to follow these warnings may result in injury or death to personnel.

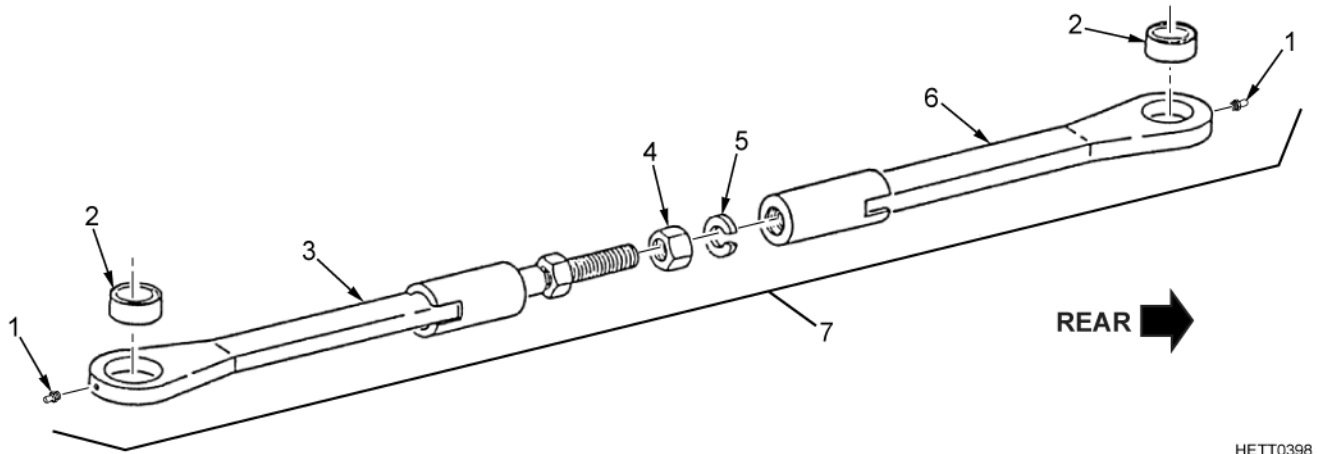
5. Clean all parts removed in degreaser tank with cleaning compound solvent and wire brush as necessary. Remove any nicks, burrs, or corrosion from polished surfaces using crocus cloth.
6. Inspect all parts removed for broken welds, nicks, burrs, pitting, and scoring. Clean parts as required and replace any parts found defective.

7. Thread nut (Figure 4, Item 4) onto machined socket (Figure 4, Item 3) and install lockwasher (Figure 4, Item 5).

NOTE

When assembling sockets together, hold the machined socket with jam nut and lockwasher stationary, and thread other machined socket clockwise until properly positioned.

8. Assemble two machined sockets (Figure 4, Item 3 and Item 6), threading machined socket the same number of turns recorded during disassembly.
9. Once both machined sockets (Figure 4, Item 3 and Item 6) are assembled, tighten nut (Figure 4, Item 4).



HETT0398

Figure 4. Longitudinal Strut Assembly.

NOTE

Longitudinal struts may be either weldments without setscrews, weldments with setscrews on the end (centerlines) (Figure 5), forgings without setscrews, or forgings with setscrews offset 30 degrees from the centerline (Figure 5). The end of the weldment is slightly thicker than the outer race of the bearing. The end of the forging is approximately the same thickness as the outer race. Bearing installation will vary slightly between configurations.

10. Remove corrosion preventive coating from outer diameter of new bearings before installation.

NOTE

Do not orient fracture in bearing outer ring in line with setscrew hole.

11. Install plain bearing (Figure 5, Item 3) into each end of longitudinal strut (Figure 5, Item 4). If strut is weldment, ensure outer race (Figure 5, Item 2) of plain bearing is centered within strut socket within 0.30 in. If strut is forging with setscrews, ensure outer race is flush with side of strut that has punched countersink or X reference mark. Forgings without setscrews (Figure 5, Item 1) do not have reference marks. Ensure that outer race is centered in strut and does not protrude from either side.

WARNING

- **Adhesives, solvents, and sealing compounds may burn easily, may give off harmful vapors, and are harmful to skin and clothing. Keep away from open flames and use in well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.**
- **On direct contact, uncured silicone sealant irritates eyes. In case of contact, flush eyes with water and seek medical attention. In case of skin contact, wipe off and flush with water.**

Failure to follow these warnings may result in injury or death to personnel.

12. Apply thread locking compound to two setscrews (Figure 5, Item 1), if applicable, and install setscrews into longitudinal strut (Figure 5, Item 4) to secure plain bearings (Figure 5, Item 3). If strut is forging, torque setscrews to 50 to 70 in.-lb (4.2 to 5.8 Nm).

CAUTION

When staking plain bearings, use fixtures as necessary to support strut rod ends and bearings, or the bearing may be forced out of centered position in rod end, causing damage to bearings.

13. If desired, use a center punch to stake each plain bearing (Figure 5, Item 3) in three places, 120 degrees apart on each side of longitudinal strut (Figure 5, Item 4). Peen material from strut rod end over edge of outer race (Figure 5, Item 2).

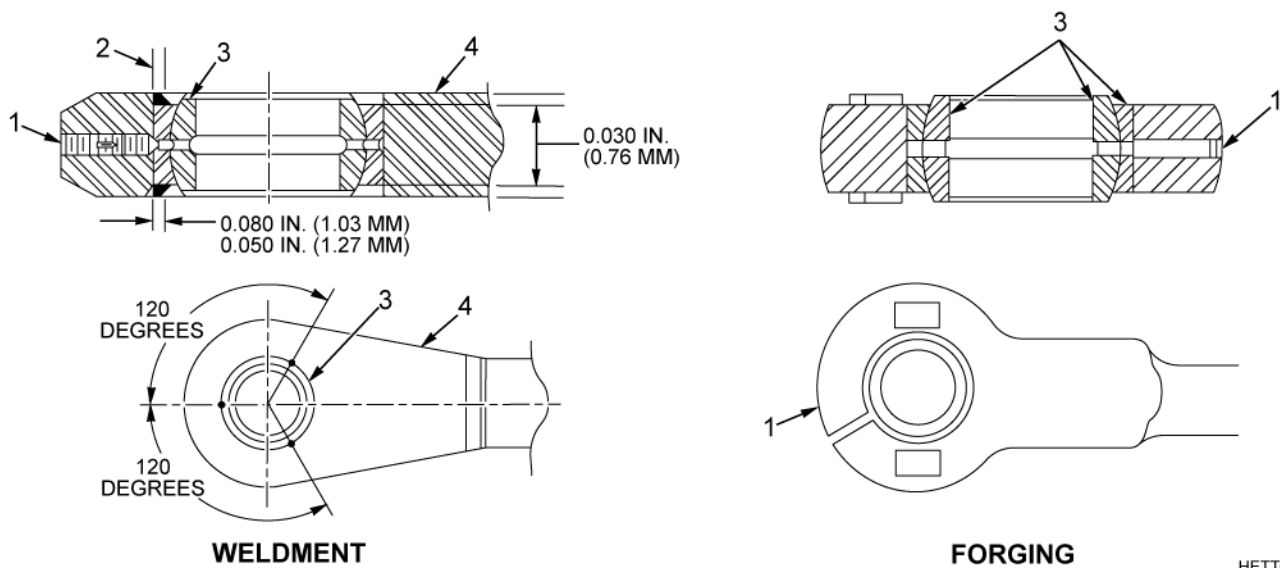


Figure 5. Installation of Plain Bearing on End of Longitudinal Strut.

END OF TASK

HETT0399

INSTALLATION

WARNING



- Adhesives, solvents, and sealing compounds may burn easily, may give off harmful vapors, and are harmful to skin and clothing. Keep away from open flames and use in well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.
- On direct contact, uncured silicone sealant irritates eyes. In case of contact, flush eyes with water and seek medical attention. In case of skin contact, wipe off and flush with water.

Failure to follow these warnings may result in injury or death to personnel.

NOTE

Eight ends of the six longitudinal struts that attach to steering plates on bogies no. 3 and no. 4 are identical. Perform steps 1 thru 7 to install one end of longitudinal strut to no. 3 or no. 4 steering plate.

1. Apply grease to two retainer packings (Figure 6, Item 5) and apply grease to spacer sleeve (Figure 6, Item 6). Assemble two retainer packings onto spacer sleeve.

CAUTION

Ensure longitudinal struts running from steering plates no. 2 and no. 5 are above longitudinal struts running between steering plates no. 3 and no. 4 or damage to equipment may result.

NOTE

Arrange longitudinal struts onto semitrailer so that the jam nut is facing toward the rear of the semitrailer.

2. Use two people to align and install spacer sleeve (Figure 6, Item 6) between two longitudinal struts (Figure 6, Item 4) and set in place on steering plate (Figure 6, Item 9). Ensure jam nut end of longitudinal strut faces toward rear of semitrailer.
3. Apply grease to retainer packing (Figure 6, Item 3). Apply grease to pin assembly (Figure 6 item 2). Install retainer packing to pin assembly.
4. Install pin assembly (Figure 6, Item 2) into steering plate (Figure 6, Item 9) through two longitudinal struts (Figure 6, Item 4). Check that flat on pin assembly is aligned with stop tab on top of steering plate and continue to drive pin assembly until flush with steering plate. Install lubrication fitting (Figure 6, Item 1) into pin assembly.
5. Apply grease to retainer packing (Figure 6, Item 3). Apply grease to sleeve bushing (Figure 6, Item 7). Assemble retainer packing onto sleeve bushing.

6. Install sleeve bushing (Figure 6, Item 7) onto steering plate (Figure 6, Item 9). Install new self-locking special bolt (Figure 6, Item 8) to secure sleeve bushing.
7. Use torque wrench to torque special bolt (Figure 6, Item 8) to 100 to 110 lb-ft (136 to 149 Nm). Install lubrication fitting (Figure 6, Item 1) into special bolt.

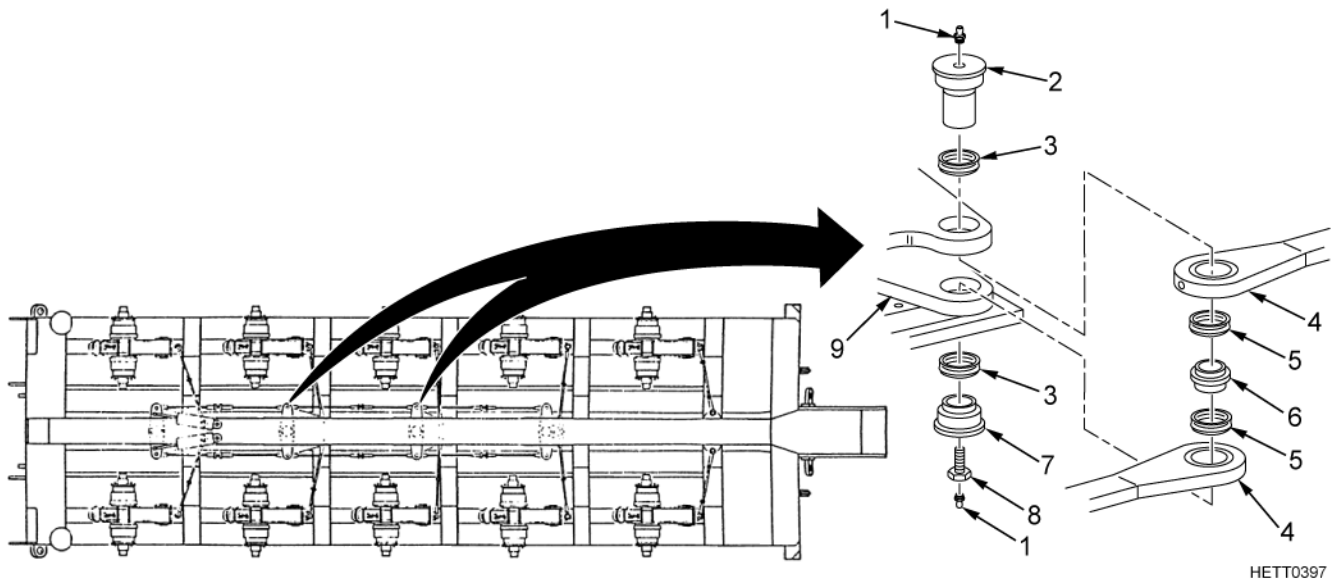


Figure 6. Grease Application.

NOTE

Four ends of the six longitudinal struts that attach to steering plates no. 2 and no. 5 are identical. Perform steps 8 thru 13 to install one end of longitudinal strut to no. 2 or no. 5 steering plate.

8. Apply grease to retainer packing (Figure 7, Item 2). Apply grease to pin assembly (Figure 7, Item 1). Install retainer packing on pin assembly.

NOTE

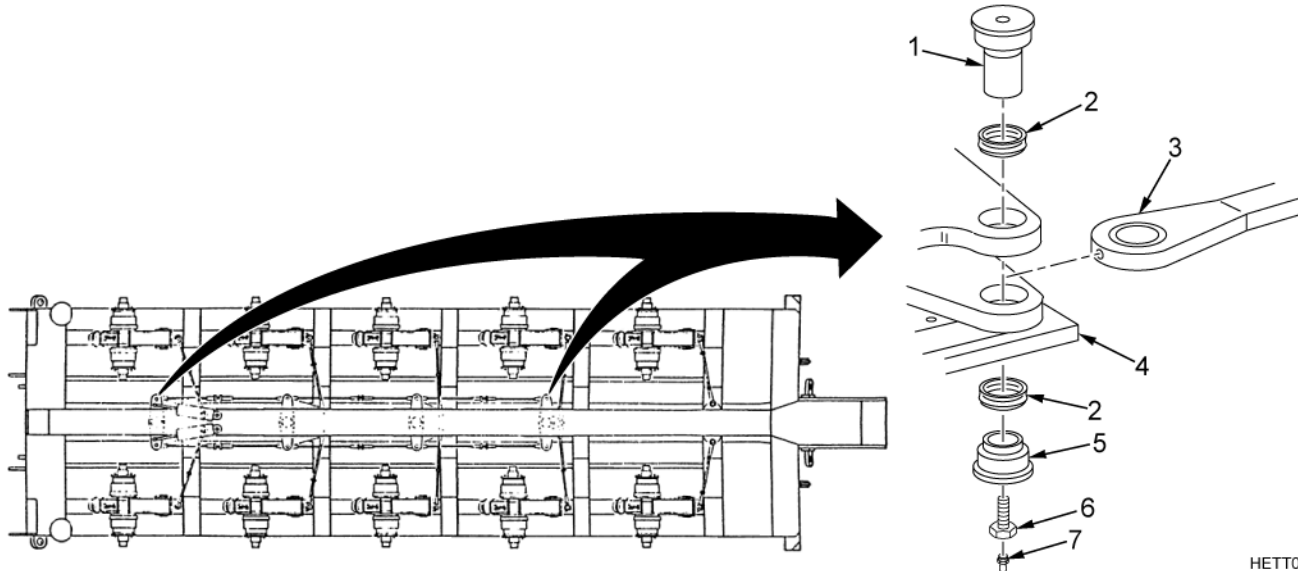
When installing a pin assembly into a steering plate, it may be necessary to use a pry bar to ease the installation. Use the pry bar to pry the pin assembly downward into the steering plate.

9. Place longitudinal strut (Figure 7, Item 3) in place on steering plate (Figure 7, Item 4). Use hammer and pry bar, if necessary, to install pin assembly (Figure 7, Item 1) into steering plate through longitudinal strut. Ensure flat on pin assembly is aligned with stop tab on top of steering plate and continue to drive pin assembly until flush with steering plate.

CAUTION

DO NOT apply grease to inner wear surface of sleeve bushing. It may get onto bolt threads, minimizing the effect of the self-locking feature and causing damage to equipment.

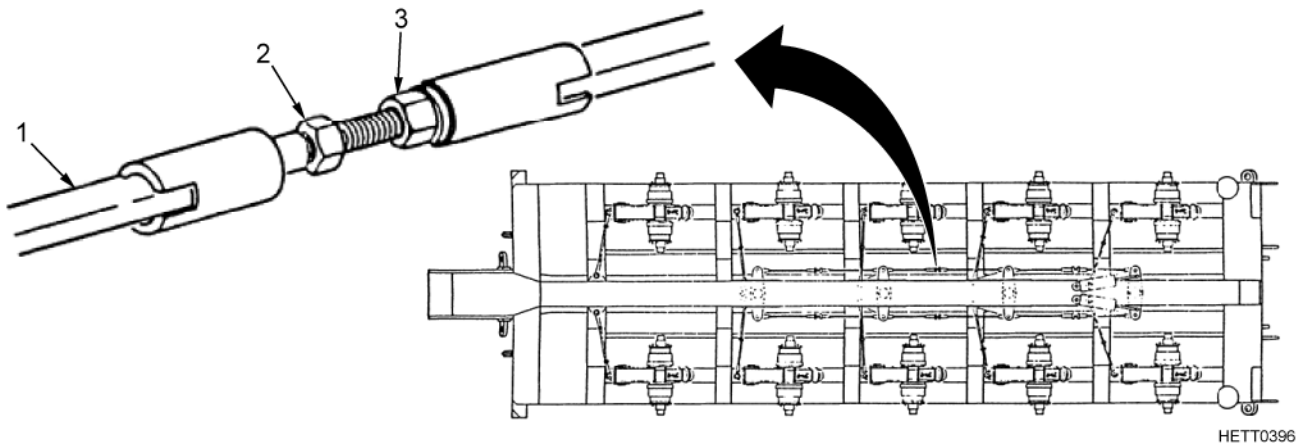
10. Apply grease to retainer packing (Figure 7, Item 2). Apply grease to outside wear surface of sleeve bushing (Figure 7, Item 5). Assemble retainer packing onto sleeve bushing.
11. Use hammer to install sleeve bushing (Figure 7, Item 5) onto steering plate (Figure 7, Item 4). Install new self-locking special bolt (Figure 7, Item 6) and secure sleeve bushing.
12. Use torque wrench to torque special bolt (Figure 7, Item 6) to 100 to 110 lb-ft (136 to 149 Nm). Install lubrication fitting (Figure 7, Item 7) into special bolt.



HETT0815

Figure 7. Installation of Longitudinal Strut.

13. Tighten adjusting nut (Figure 8, Item 2) one and one-half turns. Tighten jam nut (Figure 8, Item 3) to secure the longitudinal strut (Figure 8, Item 1).



HETT0396

Figure 8. Installation of Longitudinal Strut.

END OF TASK

FOLLOW-ON MAINTENANCE

Perform required lubrication (WP 0163).

Perform platform steering alignment (WP 0038).

END OF WORK PACKAGE

FIELD MAINTENANCE
PLATFORM STEERING CYLINDER

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Lockwasher (1)
Seal (4)
Hose, Clear, 36 in. Long (2)
Bolt, Self-Locking (2)
Special Bolt, Self-Locking (2)

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Grease (WP 0170, Item 16)
Pipe Sealant (WP 0170, Item 22)
Solvent, Cleaning Compound (WP 0170, Item 31)
Sealant Compound Thread Locking (WP 0170, Item 25)
Lockwasher (2)

Personnel Required

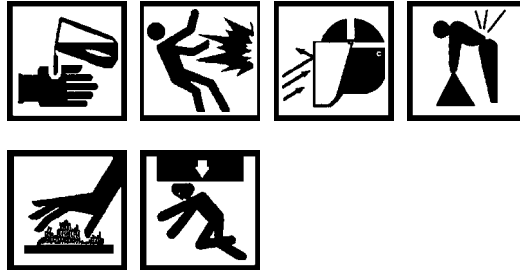
2

Equipment Conditions

Manual steering set straight (WP 0010)
Longitudinal struts removed (WP 0083)

GENERAL INFORMATION

This work package contains instructions for removal, installation, and cylinder stop adjustment of the platform steering cylinder.

REMOVAL**WARNING**

- Hydraulic fluid may be hot if system has been in operation. Allow time for system to cool before performing maintenance.
- Hydraulic fluid may be under pressure. Use caution when disconnecting hydraulic lines or components. Face shields or goggles must be worn.
- Hydraulic fluid may be absorbed through the skin. Avoid prolonged exposure to skin, wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into the eyes, flush them immediately with water and seek medical attention. If hydraulic fluid gets on skin, wash thoroughly with soap and water. Wash hands thoroughly prior to eating or smoking.
- A steering hydraulic cylinder weighs (empty) 110 lb (50 kg). Two personnel must support and lift cylinders from attaching points on platform cylinder mount and steering plate no. 5.

Failure to follow these warnings may result in serious injury or death to personnel.

NOTE

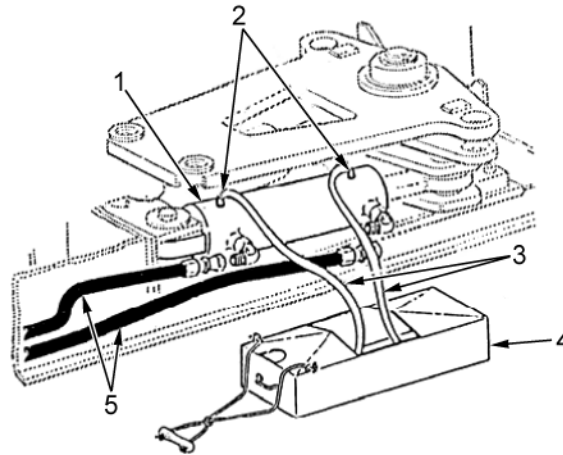
The following procedure is to be used for either the streetside or curbside platform steering cylinder. Repeat this procedure as necessary for other cylinder repairs.

1. Use two 36 in. (91 cm) clear hoses (Figure 1, Item 3) and drain pan (Figure 1, Item 4) to bleed steering cylinder (Figure 1, Item 1) at bleed valves (Figure 1, Item 2) to relieve hydraulic pressure (WP 0041). Once pressure is bled, remove two 36 in. (91 cm) clear hoses.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or foreign material from entering the hydraulic system or damage to equipment may result.

2. Tag and disconnect two hydraulic lines (Figure 1, Item 5) from steering cylinder (Figure 1, Item 1). Allow fluid to drain from lines into drain pan (Figure 1, Item 4) and install caps/plugs into all openings.



HETT0402

Figure 1. Bleeding Steering Cylinder.

3. Remove grease fitting (Figure 2, Item 15) and special bolt (Figure 2, Item 14) from shoulder pin (Figure 2, Item 13). Discard special bolt. Discard lockwasher if present.
4. Remove capscrew (Figure 2, Item 9) from sleeve bushing (Figure 2, Item 10). Discard capscrew. Discard lockwasher if present.
5. Use pry bar to pry up sleeve bushing (Figure 2, Item 10) and remove sleeve bushing with seals (Figure 2, Item 11) from steering plate no. 5 (Figure 2, Item 12). Remove seals from sleeve bushing. Discard seals.
6. Use pry bar to pry down on shoulder pin (Figure 2, Item 13) and remove pin with seals (Figure 2, Item 11) from steering plate no. 5 (Figure 2, Item 12). Remove seals from shoulder pin. Discard seals.
7. Remove capscrew (Figure 2, Item 20) from sleeve bushing (Figure 2, Item 21). Discard capscrew. Discard lockwasher if present.

CAUTION

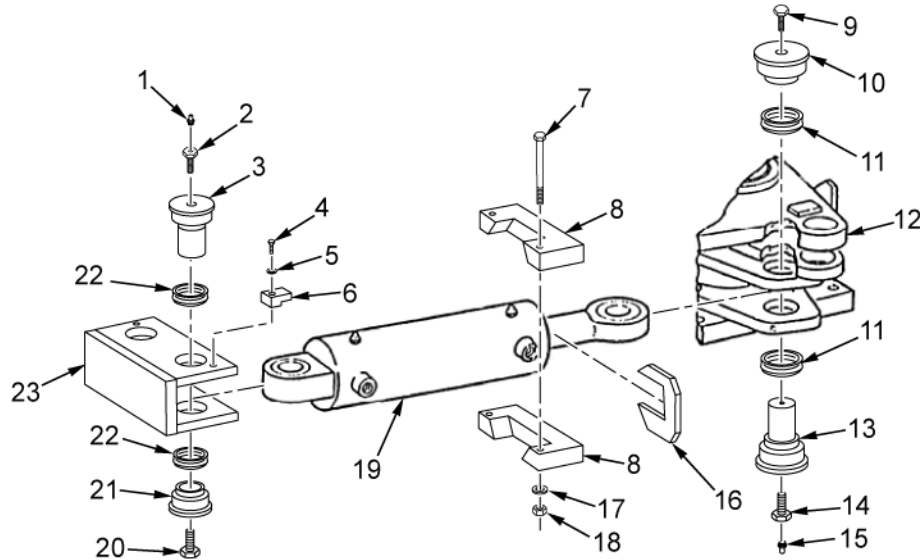
A steering hydraulic cylinder weighs (empty) 110 lb (50 kg). Two personnel must support and lift cylinders from attaching points on platform cylinder mount and steering plate no. 5 or serious injury to personnel may result.

8. Use pry bar to pry down on sleeve bushing (Figure 2, Item 21) and remove sleeve bushing from platform cylinder mount (Figure 2, Item 23). Remove seals (Figure 2, Item 22) from sleeve bushing. Discard seals.
9. Remove grease fitting (Figure 2, Item 1) and special bolt (Figure 2, Item 2) from shoulder pin (Figure 2, Item 3). Discard special bolt. Discard lockwasher if present.
10. Remove screw (Figure 2, Item 4), lockwasher (Figure 2, Item 5), and clamp (Figure 2, Item 6) from platform cylinder mount (Figure 2, Item 23). Discard lockwasher.
11. Use pry bar to pry up on shoulder pin (Figure 2, Item 3) and remove pin from platform cylinder mount (Figure 2, Item 23). Remove seal (Figure 2, Item 22) from shoulder pin. Discard seal.
12. Use two personnel to lift steering cylinder (Figure 2, Item 19) off platform cylinder mount (Figure 2, Item 23) and steering plate no. 5 (Figure 2, Item 12) and move cylinder out from under platform. Place steering cylinder onto platform.

NOTE

Steering stop blocks and associated hardware are not used on vehicles with manufacturer's serial numbers 526 and subsequent numbers. Manufacturer's serial number is stamped in front of platform mainbeam under the gooseneck.

13. Remove two nuts (Figure 2, Item 18), lockwashers (Figure 2, Item 17), capscrews (Figure 2, Item 7), two steering stop blocks (Figure 2, Item 8), and spacer plate (Figure 2, Item 16) from steering cylinder (Figure 2, Item 19). Discard lockwashers.



HETT0403

Figure 2. Steering Cylinder Removal.

WARNING**SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
- The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound.
- Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.

Failure to follow these warnings may result in injury or death to personnel.

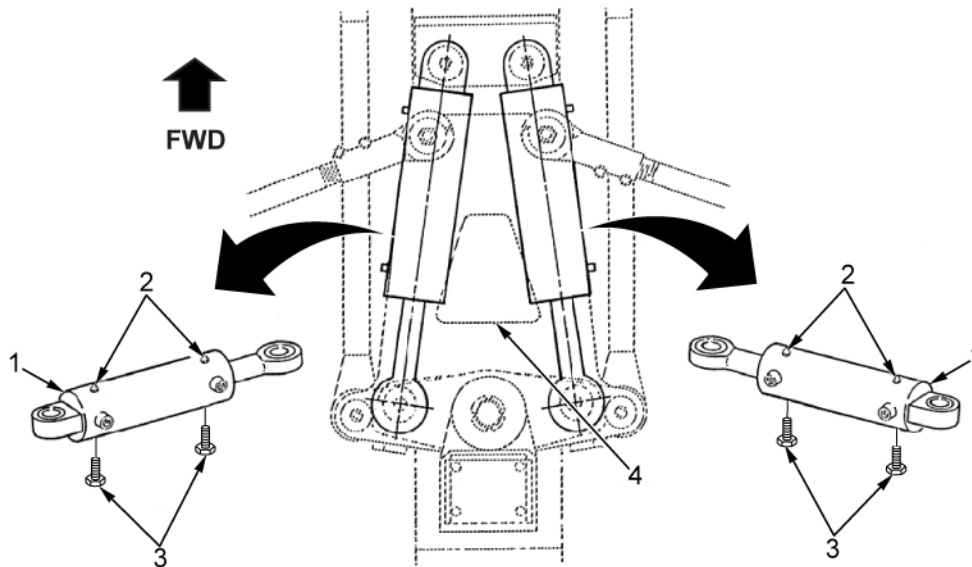
14. Clean all parts removed in degreaser tank using cleaning compound solvent. Use a crocus cloth to remove any nicks, scoring, or burrs from polished or machined surfaces.
15. Inspect steering cylinder and related parts for gouges, cracks, bends, and defects. Replace related parts if found defective. If steering cylinder is defective, replace as required.

END OF TASK

INSTALLATION**NOTE**

A new steering cylinder has four bleed valves installed. Two of the bleed valves must be removed and replaced with two pipe plugs. The location of pipe plugs is determined by location of the steering cylinder. Refer to the procedure below to check for proper bleed valve and pipe plug orientation.

1. Check steering cylinder (Figure 3, Item 1), bleed valve (Figure 3, Item 2), and pipe plug (Figure 3, Item 3) orientation per steps 2 through 4.
2. If steering cylinder (Figure 3, Item 1) is to be installed on curbside of steering plate no. 5 (Figure 3, Item 4), hydraulic lines (Figure 5), should face curbside (outboard of no. 5 plate) with pipe plugs (Figure 3, Item 3) located on bottom of cylinder, and bleed valves (Figure 3, Item 2) located on top of cylinder.
3. If steering cylinder (Figure 3, Item 1) is to be installed on streetside of steering plate no. 5 (Figure 3, Item 4), hydraulic lines (Figure 5), should face streetside (outboard of no. 5 plate) with pipe plugs (Figure 3, Item 3) located on bottom of cylinder, and bleed valves (Figure 3, Item 2) located on top of cylinder.
4. After determining where on steering plate no. 5 (Figure 3, Item 4) steering cylinder (Figure 3, Item 1) is to be installed (see steps 2 and 3 above), remove two bleed valves (Figure 3, Item 2) from bottom of steering cylinder. Apply pipe sealant to male threads of two pipe plugs (Figure 3, Item 3). Install two pipe plugs into bottom of steering cylinder.



HETT0404

Figure 3. Bleed Valves and Pipe Plugs Installation.

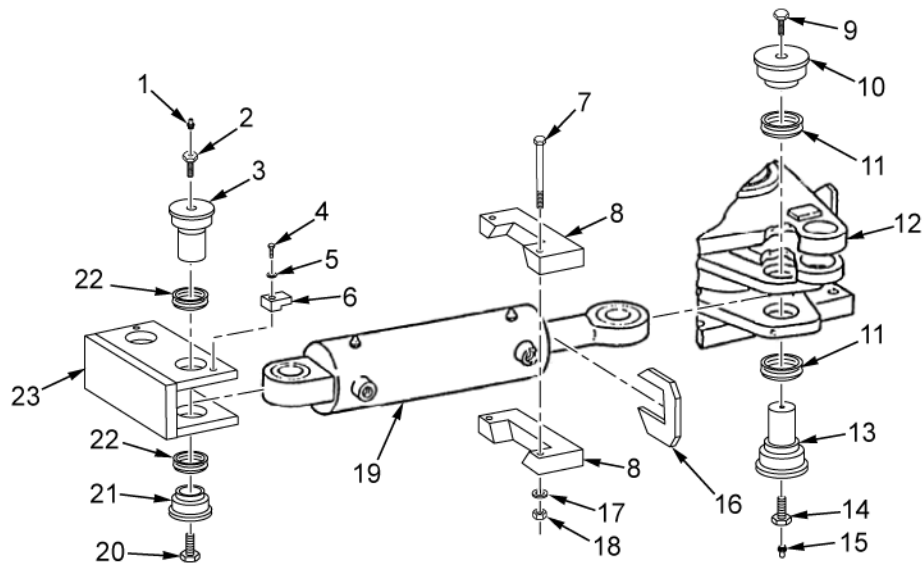
NOTE

- The nuts securing the cylinder stop blocks are to be hand-tightened only. Following installation of the cylinder, stop block adjustment (shimming) is required.
 - Steering stop blocks and associated hardware are not used on vehicles with manufacturer's serial numbers 526 and subsequent numbers. Manufacturer's serial number is stamped in front of platform main beam under the gooseneck.
5. Install spacer plate (Figure 4, Item 16) and steering stop blocks (Figure 4, Item 8) onto steering cylinder (Figure 4, Item 19). Secure spacer plate in place with two capscrews (Figure 4, Item 7), lockwashers (Figure 4, Item 17), and nuts (Figure 4, Item 18).

CAUTION

DO NOT apply grease to inner wear surface of sleeve bushing. It may get onto bolt threads, minimizing the effect of self-locking feature and causing damage to equipment.

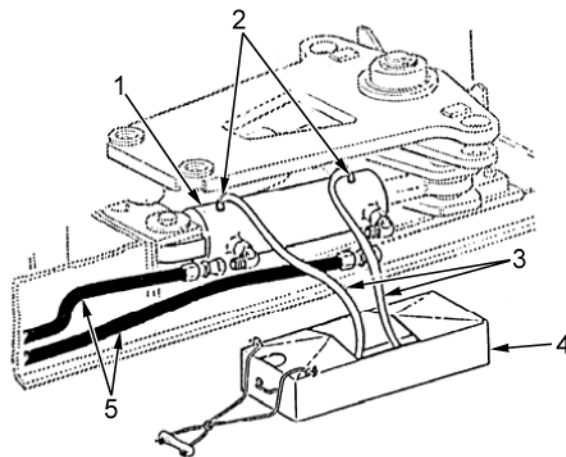
6. Apply grease to inner bore of bearings on steering cylinder (Figure 4, Item 19), outside wear surfaces of two shoulder pin assemblies (Figure 4, Item 13 and Item 3), and outside wear surfaces of sleeve bushings (Figure 4, Item 10 and Item 21). Apply grease to four seals (Figure 4, Item 11 and Item 22).
7. Use two personnel to lift hydraulic cylinder (Figure 4, Item 19) into alignment with platform cylinder mount (Figure 4, Item 23) and no. 5 steering plate (Figure 4, Item 12).
8. Install seal (Figure 4, Item 22) on sleeve bushing (Figure 4, Item 21). Install seal on shoulder in (Figure 4, Item 3).
9. Use soft-faced hammer to drive shoulder pin (Figure 4, Item 3) through platform cylinder mount (Figure 4, Item 23) and hydraulic cylinder (Figure 4, Item 19). Check alignment of flat on shoulder pin and readjust position, as required, until flat is aligned with mounting hole for clamp (Figure 4, Item 6). Continue to drive shoulder pin until flush on platform cylinder mount.
10. Use pry bar to install and pry up on sleeve bushing (Figure 4, Item 21) through platform cylinder mount (Figure 4, Item 23) and onto shoulder pin (Figure 4, Item 3). Continue to pry up on sleeve bushing until flush on platform cylinder mount.
11. Secure shoulder pin (Figure 4, Item 3) to platform cylinder mount (Figure 4, Item 23) by installing clamp (Figure 4, Item 6), lockwasher (Figure 4, Item 5), and screw (Figure 4, Item 4).
12. Secure sleeve bushing (Figure 4, Item 21) to shoulder pin (Figure 4, Item 3) by installing self-locking capscrew (Figure 4, Item 20). Use torque wrench to torque capscrew to 100 to 110 lb-ft (136 to 149 Nm).
13. Install self-locking special bolt (Figure 4, Item 2) onto shouldered pin (Figure 4, Item 3). Install lubrication fitting (Figure 4, Item 1) into special bolt.
14. Install seals (Figure 4, Item 11) on sleeve bushing (Figure 4, Item 10). Install seal on shoulder pin (Figure 4, Item 13).
15. Use pry bar to install and pry up on shouldered pin (Figure 4, Item 13) through steering plate no. 5 (Figure 4, Item 12) and hydraulic cylinder (Figure 4, Item 19). Check alignment of flat on shouldered pin and readjust position, as required, until flat is aligned with stop tab on bottom of steering plate no. 5. Continue to pry up on shoulder pin (Figure 4, Item 3) until pin is flush on platform cylinder steering plate no. 5.
16. Install sleeve bushing (Figure 4, Item 10) over shoulder pin (Figure 4, Item 13) on steering plate no. 5 (Figure 4, Item 12). Use pry bar to pry down on sleeve bushing to install bushing through steering plate no. 5 and onto shoulder pin. Continue to pry down on sleeve bushing until bushing is flush on steering plate no. 5.
17. Secure sleeve bushing (Figure 4, Item 10) to shoulder pin (Figure 4, Item 13) by installing self-locking capscrew (Figure 4, Item 9). Use torque wrench and a 15/16 in. crow's foot adapter to torque capscrew to 100 to 110 lb-ft (136 to 149 Nm).
18. Install self-locking special bolt (Figure 4, Item 14) onto shoulder pin (Figure 4, Item 13). Install lubrication fitting (Figure 4, Item 15) into special bolt.



HETT0403

Figure 4. Install Spacers and Stop Blocks.

19. Remove drain pan (Figure 5, Item 4) and caps/plugs installed. Reconnect two hydraulic lines (Figure 5, Item 5) to steering hydraulic cylinder (Figure 5, Item 1). Close bleed valves (Figure 5, Item 2) and remove clear hoses (Figure 5, Item 3).
20. Perform cylinder stop adjustment, if necessary.



HETT0402

Figure 5. Hydraulic Lines and Bleed Valves.

END OF TASK

CYLINDER STOP ADJUSTMENT

NOTE

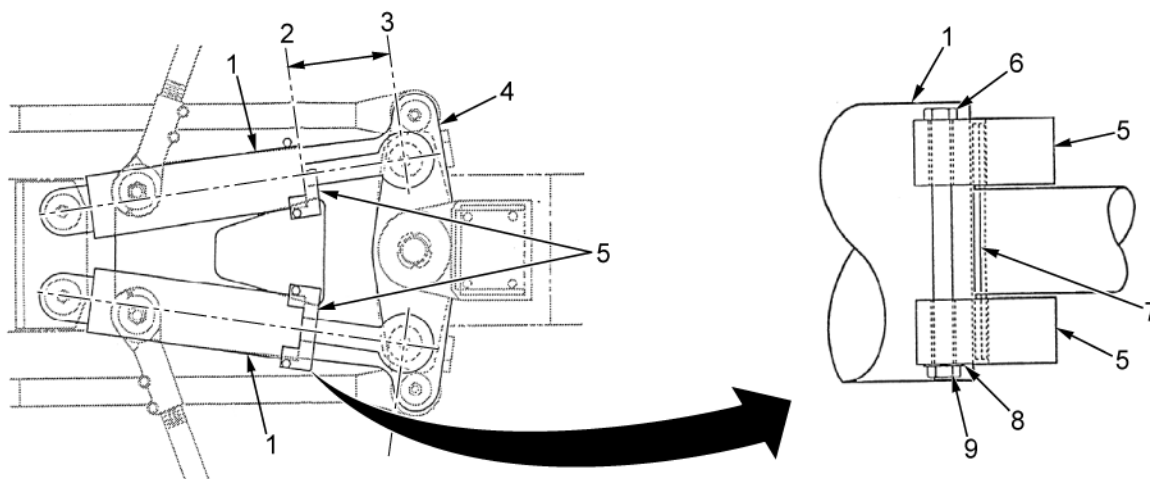
Steering stop blocks and associated hardware are not used on vehicles with manufacturer's serial numbers 526 and subsequent numbers. Manufacturer's serial number is stamped in front of platform main beam under the gooseneck. On units without cylinder stops, this procedure is unnecessary.

1. Measure distance dimension on both cylinders (Figure 6, Item 1) between cylinder piston attaching point (Figure 6, Item 3) on no. 5 steering plate (Figure 6, Item 4) and piston end (Figure 6, Item 2) of cylinder body. If dimension distance between cylinder piston attaching point and piston end of cylinder body is same for both cylinders, go to step 3. If dimension distance is not same, go to step 2.
2. Perform manual steering (WP 0010) to move steering plate no. 5 (Figure 6, Item 4) until both dimensions are same and then go to step 3.
3. Compare distance dimension between piston end of cylinder body (Figure 6, Item 2) and cylinder piston attaching point (Figure 6, Item 3) with "shim" chart (Table 1) and determine quantity of spacer plates (Figure 6, Item 7) required for each cylinder.

Table 1. Spacer Plate Shim Chart.

Distance Dimension between Figure 6, Item 2 and Item 3	QUANTITY (Figure 6, Item 7)
9.18 to 9.30 in. (23.32 to 23.62 cm)	1 Required
9.31 to 9.43 in. (23.64 to 23.95 cm)	2 Required
9.44 to 9.56 in. (23.98 to 24.28 cm)	3 Required

4. Loosen nuts (Figure 6, Item 9) sufficiently to move stop blocks (Figure 6, Item 5) off of cylinders and insert required number of spacer plates (Figure 6, Item 7) into stop blocks.
5. Install stop blocks (Figure 6, Item 5) on each cylinder (Figure 6, Item 1) and secure stop blocks on cylinders with capscrews (Figure 6, Item 6), lockwashers (Figure 6, Item 8), and nuts (Figure 6, Item 9).



HETT0407

Figure 6. Installation and Adjustment of Cylinders.

END OF TASK

FOLLOW-ON MAINTENANCE

Install longitudinal strut (WP 0083).

Perform required lubrication (WP 0163).

Perform hydraulic system bleeding to remove air from hydraulic steering system (WP 0041).

Perform platform steering alignment (WP 0038).

END OF WORK PACKAGE

FIELD MAINTENANCE**STEERING PLATE**

INITIAL SETUP:**Tools and Special Tools**

Chain Assy, 5/16 in. LK, 11 ft L (2) (WP 0168, Item 8)
General Mechanic's Tool Kit (WP 0168, Item 11)
Spanner, Adjustable Hook (WP 0168, Item 22)
Truck, Wrecker M984 (WP 0168, Item 26)

Materials/Parts

Grease (WP 0170, Item 16)
Sealant Compound Thread Locking (WP 0170, Item 25)
Solvent, Dry Cleaning (WP 0170, Item 32)
Wood Pieces, Scrap, 3/4 in. to 1 in. Thick (1)
Steel Bar, Stock 1 in. Diameter 24 in. L (1)
Wood Block, 12 in. x 12 in. x 24 in. (4)
Lockwasher (6)

Personnel Required

3

Equipment Conditions

Gooseneck lowered to lowest position, if uncoupled (WP 0007)
Connecting links removed at affected bogies (WP 0080)
Inner/inner wheels (streetside and curbside) removed from affected bogie (WP 0078 and WP 0079)
Platform adjusted to 50 in. (143 cm) height (WP 0008)
Suspension isolation valves closed at four corner bogies (WP 0004)
Longitudinal struts removed at affected bogies (WP 0083)
Platform steering cylinders removed or disconnected from steering plate (WP 0085) (no. 5 bogie only)

GENERAL INFORMATION

This work package contains instructions for removal, repair, inspection, assembly, and installation of the steering plate.

REMOVAL**WARNING**

Steering plates weigh in excess of 250 lb (223 kg) and must be supported the entire time work is performed on the steering plate or injury to personnel may result.

NOTE

All four steering plates are similar and are removed and installed in the same manner.

1. Clean all dirt from steering plate spacer (Figure 1, Item 3) and retainer plate (Figure 1, Item 1).
2. Remove four capscrews (Figure 1, Item 6) and lockwashers (Figure 1, Item 7) from retainer plate (Figure 1, Item 1). Discard lockwashers.
3. Check position of two straight pins (Figure 1, Item 5) and retainer plate (Figure 1, Item 1). If pins are near bottom of retainer plate, drive pins upward approximately 0.25 in. (6.35 mm) into mainbeam (Figure 1, Item 2) weldment (Figure 1, Item 4).

NOTE

It is necessary to evenly pry down on both the front and back of the retainer plate, to pry down on the steering plate spacer, so that the retainer plate can be lowered clear of the pins.

4. Use two personnel and crowbar or low-profile hydraulic jack, if available, to pry down on retainer plate (Figure 1, Item 1) until retainer plate moves down on steering plate spacer (Figure 1, Item 3) and is clear of two straight pins (Figure 1, Item 5).
5. Rotate retainer plate (Figure 1, Item 1) 90 degrees clockwise facing streetside and then pry up and remove retainer plate from steering plate spacer (Figure 1, Item 3).

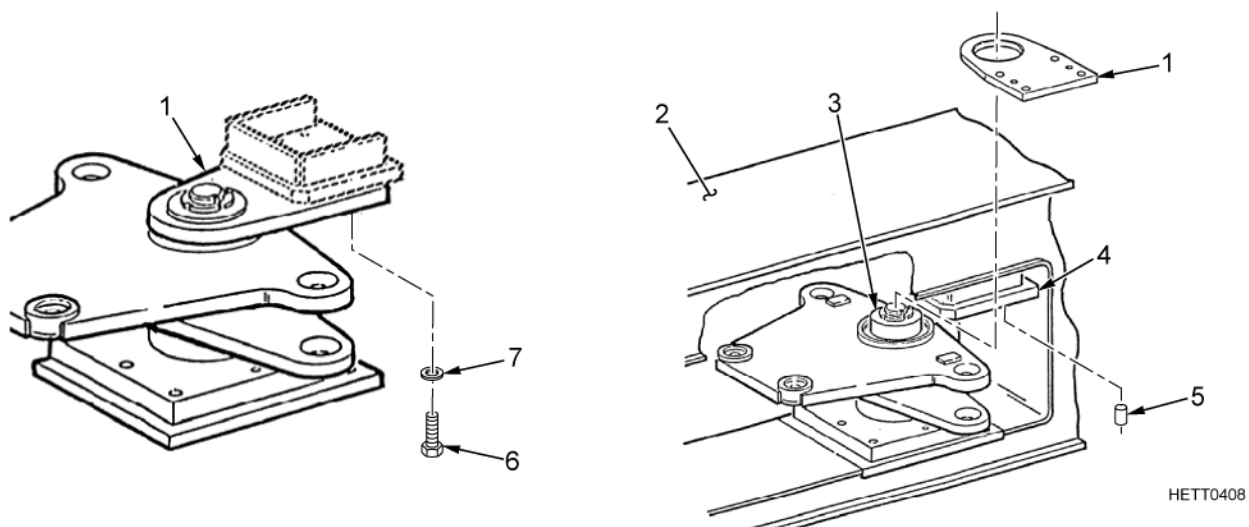


Figure 1. Prying Retainer Plate.

6. Loosen two bolts (Figure 2, Item 2) on service covers (Figure 2, Item 3) and slide retainers (Figure 2, Item 1) inboard to release and remove service covers (Figure 2, Item 3) from platform (Figure 2, Item 8).
7. Remove six capscrews (Figure 2, Item 7) and lockwashers (Figure 2, Item 6) from steering plate (Figure 2, Item 5) and mainbeam (Figure 2, Item 4). Discard six lockwashers.

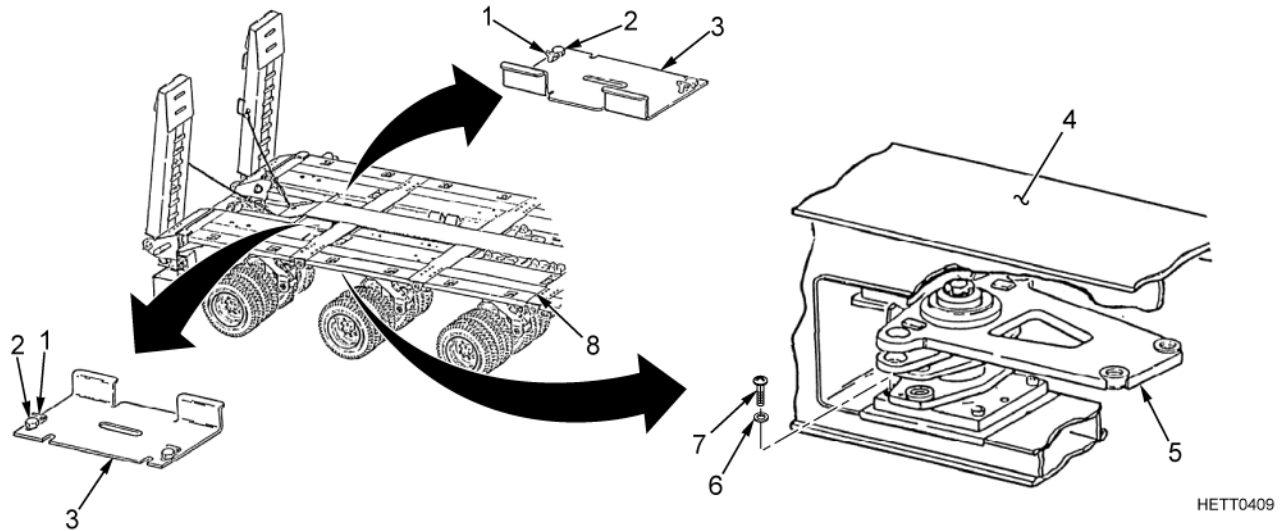


Figure 2. Removal of Retainer Plate.

8. Place chain (Figure 3, Item 1) under rear portion of top of steering plate (Figure 3, Item 3). Bring chain forward and up on both sides and hook chain back to itself above top of steering plate just forward of spindle (Figure 3, Item 2).

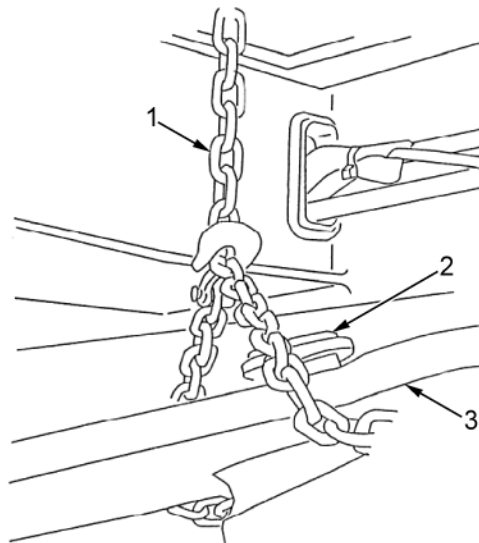


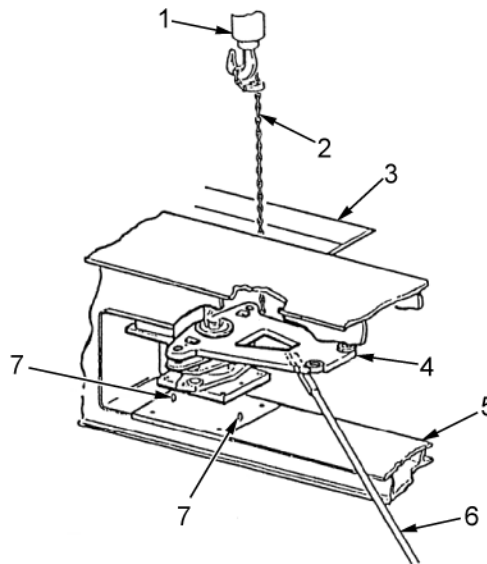
Figure 3. Chain Under Steering Plate.

WARNING

When using a lifting device to lift the steering plate, all personnel under the platform must keep hands clear of the steering plate and support equipment. Failure to follow this warning may result in serious injury or death to personnel.

CAUTION

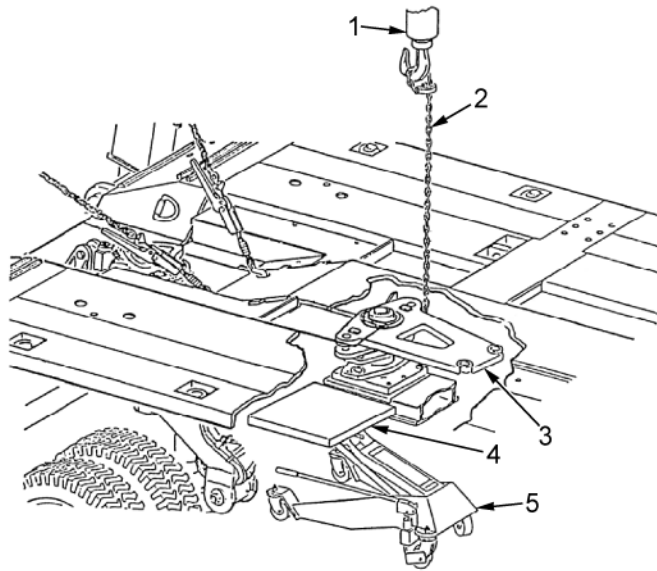
- When lifting the steering plate off the mainbeam, lift the steering plate upward as straight as possible and have one person use a crowbar to keep forward part of steering plate level or damage to the straight pins may result.
 - As the steering plate is moved, it must be guided away from the air relay valve in the same window. Otherwise, damage to equipment may result.
 - Be sure chains do not contact hydraulic or pneumatic lines along the mainbeam or damage to equipment may result.
9. Position suitable lifting device (Figure 4, Item 1) where service covers were removed above platform (Figure 4, Item 3).
 10. Route chain (Figure 4, Item 2) up through platform (Figure 4, Item 3) and mainbeam (Figure 4, Item 5) and attach to lifting device (Figure 4, Item 1). Apply just enough lifting force to bring base of steering plate (Figure 4, Item 4) up off straight pins (Figure 4, Item 7) that position it.
 11. Guide steering plate (Figure 4, Item 4) carefully as it rises to avoid contact with air relay valve (WP 0074) in that window. Use crowbar (Figure 4, Item 6) to keep forward part of steering plate level.



HETT0411

Figure 4. Steering Plate Removal.

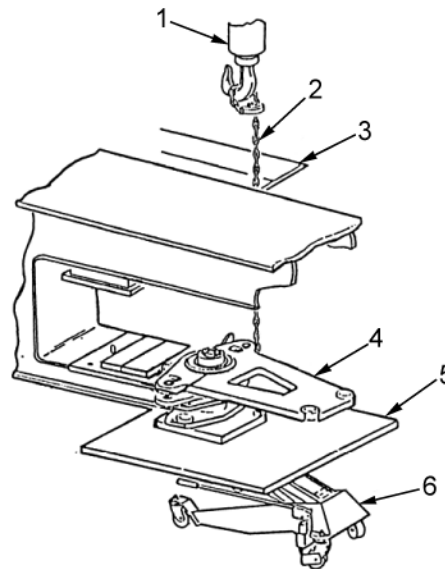
12. From curbside of trailer, position hydraulic jack (Figure 5, Item 5) near curbside of steering plate (Figure 5, Item 3). Raise hydraulic jack so that pallet (Figure 5, Item 4) is even with bottom of steering plate.
13. Use suitable lifting device (Figure 5, Item 1) and chain (Figure 5, Item 2) to raise steering plate (Figure 5, Item 3) and maneuver steering plate over onto hydraulic jack (Figure 5, Item 5).



HETT0412

Figure 5. Positioned Hydraulic Jack Near Curbside of Steering Plate.

14. Lower steering plate (Figure 6, Item 4) with lifting device (Figure 6, Item 1) so that it rests on pallet (Figure 6, Item 5) of hydraulic jack (Figure 6, Item 6). Remove chain (Figure 6, Item 2) from steering plate.
15. Use one person to keep steering plate (Figure 6, Item 4) from turning. Lower hydraulic jack (Figure 6, Item 6) and move it out and away from platform (Figure 6, Item 3).
16. Use three personnel to lift steering plate (Figure 6, Item 4) off hydraulic jack (Figure 6, Item 6) and to place steering plate on ground.



HETT0413

Figure 6. Lifting Steering Plate.

END OF TASK

REPAIR

1. Straighten bent tab on key washer (Figure 7, Item 2) and use spanner socket to remove nut (Figure 7, Item 1) and key washer from top of spindle (Figure 7, Item 9).
2. Remove ring spacer (Figure 7, Item 3), upper metal seal (Figure 7, Item 4), and upper roller bearing cone (Figure 7, Item 5) from spindle. Discard upper seal.

WARNING

Use two personnel to lift steering plate off of spindle or serious injury to personnel may result.

3. Use two people to remove steering plate (Figure 7, Item 11) from spindle (Figure 7, Item 9).
4. Remove lower bearing cone (Figure 7, Item 7) from spindle (Figure 7, Item 9).
5. Remove lower metal seal (Figure 7, Item 8) from spindle (Figure 7, Item 9). Discard lower seal.
6. Use hammer and steel drift to drive two bearing cups (Figure 7, Item 6) from steering plate (Figure 7, Item 11).
7. Remove lubrication fitting (Figure 7, Item 10) from steering plate (Figure 7, Item 11).

WARNING**SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
 - The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
 - Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
 - Fire extinguishers should be placed nearby when using solvent cleaning compound.
 - Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
 - Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.
- Failure to follow these warnings may result in injury or death to personnel.

8. Clean all components with dry cleaning solvent and rags.
9. Clean corrosion with crocus cloth.

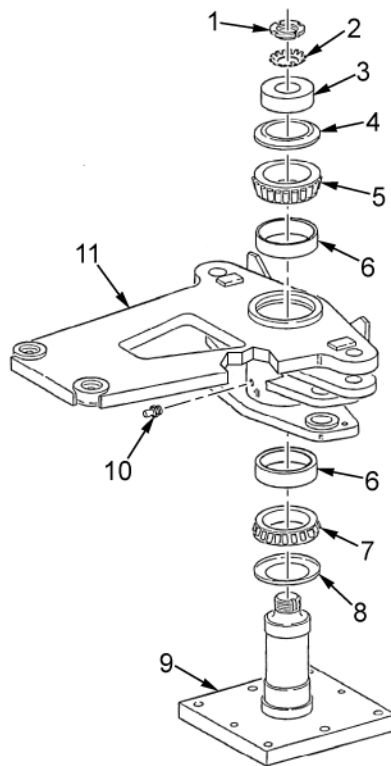


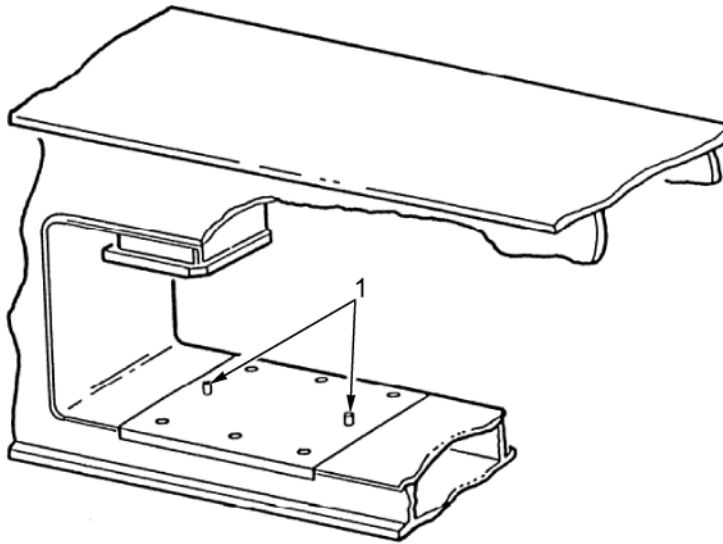
Figure 7. Component Parts Removal.

HETT0414

END OF TASK

INSPECTION

1. Inspect casting on steering plate for broken welds, cracks, bends, and corrosion. Replace defective parts.
2. Inspect for cracked, bent, or missing straight pins (Figure 8, item 1). If pins are damaged, remove and replace two straight pins.



HETT0415

Figure 8. Damage Inspection.

END OF TASK

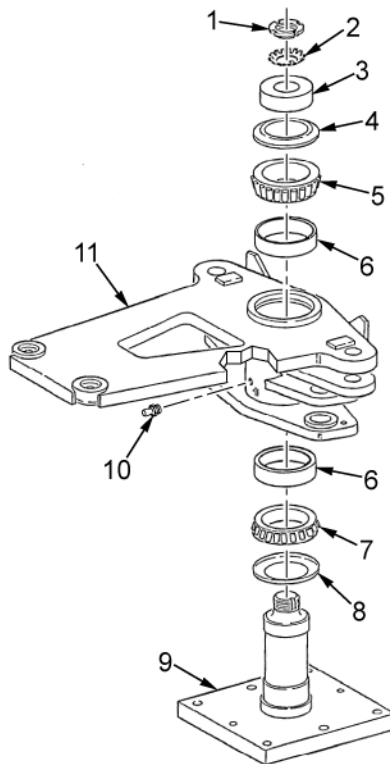
ASSEMBLY

1. Pack bearings according to lubrication instructions (WP 0163).
2. Install lubrication fitting (Figure 9, Item 10) on steering plate (Figure 9, Item 11).
3. Drive two bearing cups (Figure 9, Item 6) into steering plate (Figure 9, Item 11).
4. Install lower metal seal (Figure 9, Item 8) onto spindle (Figure 9, Item 9).

CAUTION

Use caution when installing lower bearing cone onto spindle or damage to cone or spindle may result. Apply all force to inner race of bearing cone during installation.

5. Install lower bearing cone (Figure 9, Item 7) onto spindle (Figure 9, Item 9).
6. Install steering plate (Figure 9, Item 11) onto spindle (Figure 9, Item 9).
7. Install upper bearing cone (Figure 9, Item 5), upper metal seal (Figure 9, Item 4), and ring spacer (Figure 9, Item 3) with shoulder facing down toward steering plate (Figure 9, Item 11).
8. Install key washer (Figure 9, Item 2) and nut (Figure 9, Item 1) onto spindle (Figure 9, Item 9).
9. Slowly tighten nut (Figure 9, Item 1) until all side play between steering plate (Figure 9, Item 11) and spindle (Figure 9, Item 9) is eliminated.
10. Bend one tab of key washer (Figure 9, Item 2) to secure nut (Figure 9, Item 1).



HETT0414

Figure 9. Bearing Assembly.

END OF TASK

INSTALLATION

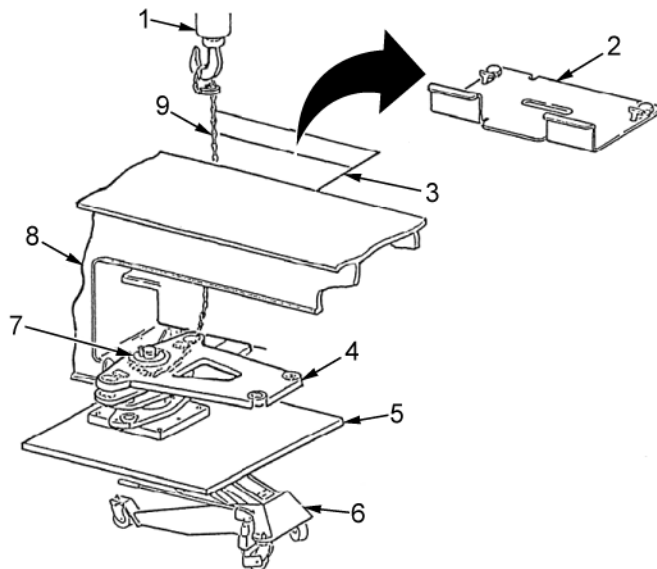
1. Use three personnel to lift steering plate (Figure 10, Item 4) off ground and place steering plate on pallet (Figure 10, Item 5) of hydraulic jack (Figure 10, Item 6).
2. Use one person to keep steering plate (Figure 10, Item 4) from turning while maneuvering hydraulic jack (Figure 10, Item 6) under platform (Figure 10, Item 3) for installation.
3. Raise hydraulic jack (Figure 10, Item 6) so that pallet (Figure 10, Item 5) is even with mainbeam (Figure 10, Item 8).
4. Position suitable lifting device (Figure 10, Item 1) where streetside service cover (Figure 10, Item 2) above platform (Figure 10, Item 3) was removed.
5. Lower chain (Figure 10, Item 9) through streetside opening in platform (Figure 10, Item 3).
6. Place chain (Figure 10, Item 9) under rear portion of top of steering plate (Figure 10, Item 4). Bring chain forward and up on both sides and hook chain back to itself above top plate just forward of spindle (Figure 10, Item 7).

WARNING



When using a lifting device to lift the steering plate, all personnel under the platform must keep hands clear of the steering plate and support equipment or injury to personnel may result.

7. Use one person to support front part of steering plate (Figure 10, Item 4) and use lifting device (Figure 10, Item 1) to carefully lift steering plate off hydraulic jack (Figure 10, Item 6). Move hydraulic jack out of way.



HETT0417

Figure 10. Steering Plate Removal from Hydraulic Jack.

CAUTION

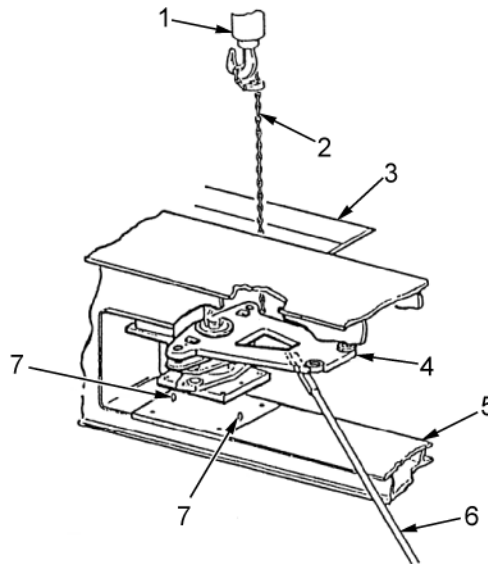
Be sure chains do not contact hydraulic or pneumatic lines along the mainbeam or damage to equipment may result.

8. Maneuver steering plate (Figure 11, Item 4) over mainbeam (Figure 11, Item 5) and into alignment over two straight pins (Figure 11, Item 7).

CAUTION

When lowering steering plate onto straight pins, ensure steering plate is as level as possible, and allow straight pins to guide steering plate into place or damage to equipment may result.

9. Above the platform (Figure 11, Item 3), use lifting device (Figure 11, Item 1) with chain (Figure 11, Item 2) to carefully lower steering plate (Figure 11, Item 4) onto mainbeam (Figure 11, Item 5) and two straight pins (Figure 11, Item 7). Use crowbar (Figure 11, Item 6) to help keep forward part of steering plate level.



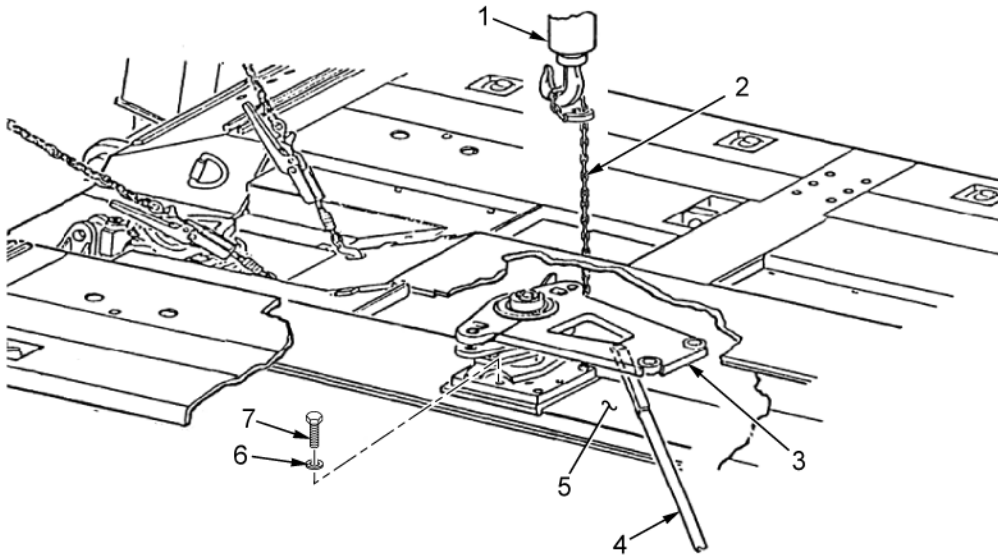
HETT0411

Figure 11. Steering Plate Alignment Over Mainbeam.

NOTE

Steering plate must be turned sufficiently to permit removal of capscrews installed at center sides of mounting plate.

10. While keeping tension on chain (Figure 12, Item 2) and using crowbar (Figure 12, Item 4) for support, rotate steering plate (Figure 12, Item 3) as required. Loosely install capscrew (Figure 12, Item 7) and lockwasher (Figure 12, Item 6) in center hole on each side of steering plate onto mainbeam (Figure 12, Item 5).
11. Lower lifting device (Figure 12, Item 1) to allow slack in chain (Figure 12, Item 2) and remove chain from steering plate (Figure 12, Item 3).
12. Remove and restow chain (Figure 12, Item 2) and lifting device (Figure 12, Item 1).



HETT0419

Figure 12. Installation of Steering Plate.

13. Rotate steering plate (Figure 13, Item 5) to center position and loosely install four remaining capscrews (Figure 13, Item 7) and lockwashers (Figure 13, Item 6) onto mainbeam (Figure 13, Item 4).
14. Torque all six capscrews (Figure 13, Item 7) to 150 to 160 lb-ft (151 to 217 Nm).
15. Install two service covers (Figure 13, Item 3) to platform (Figure 13, Item 8) and secure in place by sliding retainers (Figure 13, Item 1) in outboard direction and tightening bolts (Figure 13, Item 2).

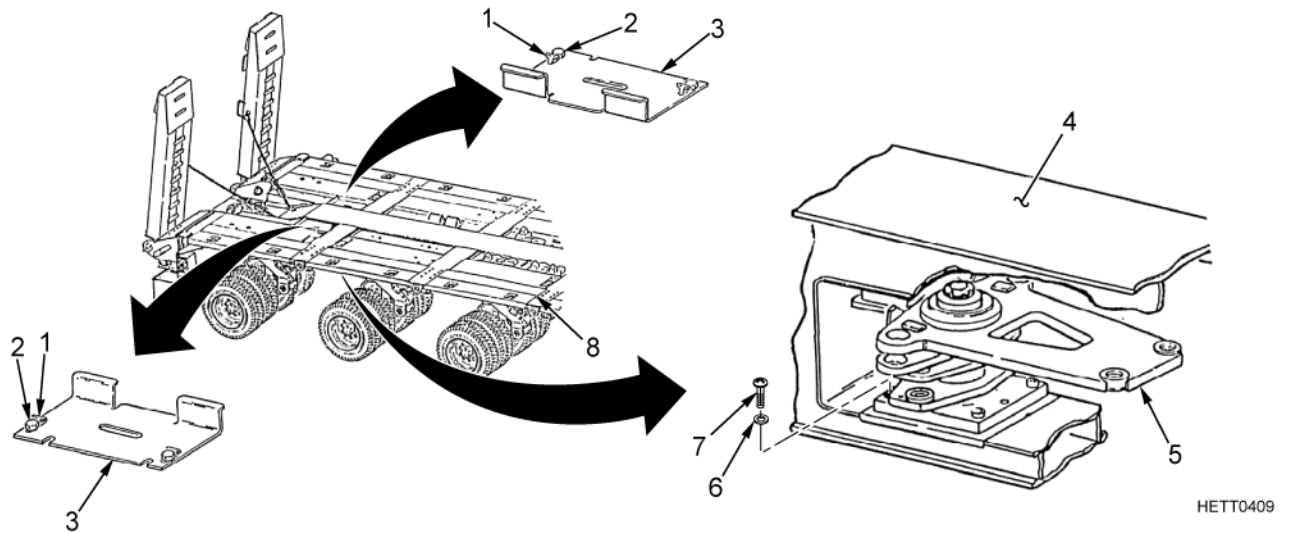


Figure 13. Install Service Covers and Secure in Place.

16. If either straight pin (Figure 14, Item 5) has been driven out, install pin into mainbeam.

WARNING



- Adhesives, solvents, and sealing compounds may burn easily, may give off harmful vapors, and are harmful to skin and clothing. Keep away from open flames and use in well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.
- On direct contact, uncured silicone sealant irritates eyes. In case of contact, flush eyes with water and seek medical attention. In case of skin contact, wipe off and flush with water.

Failure to follow these warnings may result in injury or death to personnel.

17. Apply grease to inside of large opening in retainer plate (Figure 14, item 1) and to exterior of steering plate spacer (Figure 14, Item 3).
18. Position retainer plate (Figure 14, Item 1) facing streetside. Align and install retainer plate over steering plate spacer (Figure 14, Item 3).
19. Rotate retainer plate (Figure 14, Item 1) 90 degrees counterclockwise until aligned with two straight pins (Figure 14, Item 5) in mainbeam (Figure 14, Item 2) weldment (Figure 14, Item 4).
20. Use two personnel and crowbar to pry up and drive retainer plate (Figure 14, Item 1) onto straight pins (Figure 14, Item 5).
21. Apply locking compound to threads on four capscrews (Figure 14, Item 6). Install four capscrews and lockwashers (Figure 14, Item 7) on retainer plate (Figure 14, Item 1). Torque four capscrews to 150 to 160 lb-ft (203 to 217 Nm).

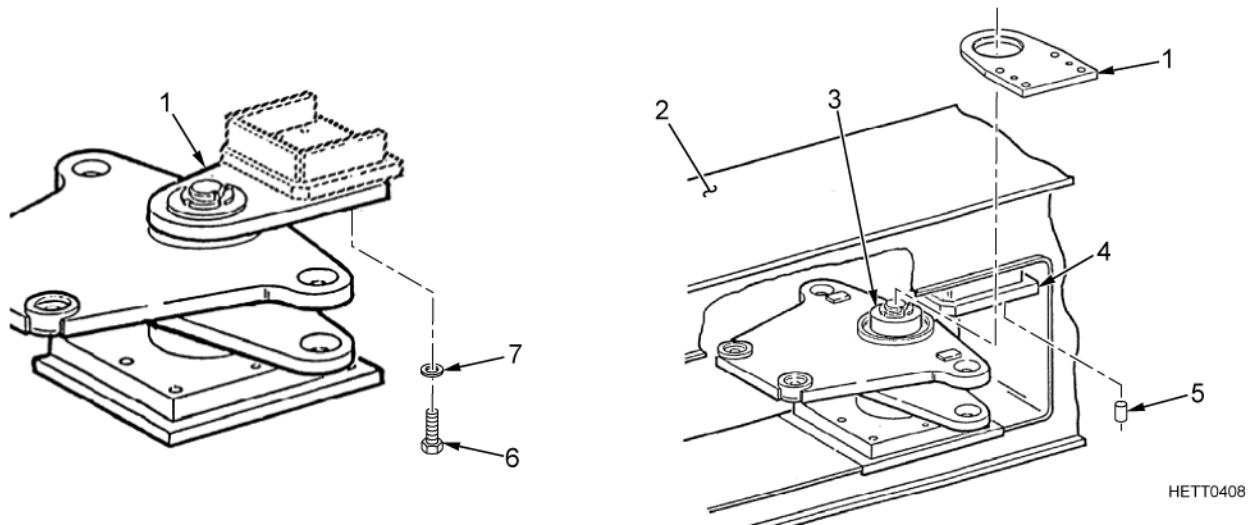


Figure 14. Torque Capscrews.

END OF TASK

FOLLOW-ON MAINTENANCE

Perform required lubrication (WP 0163).

Perform platform steering alignment (WP 0038).

If not already coupled, couple tractor/semitrailer (WP 0013).

END OF WORK PACKAGE

FIELD MAINTENANCE
GOOSENECK STEERING CYLINDER

INITIAL SETUP:**Tools and Special Tools**

Mandrel, Suspension (WP 0168, Item 5)
General Mechanic's Tool Kit (WP 0168, Item 11)
Lifting Strap (WP 0168, Item 25)
Standard Army Tool Set (WP 0168, Item 28)
Davit (WP 0168, Item 29)

Ring Spacer (2)
Nonmetallic Seal (2)
Special Bolt, Self-Locking (1)

Personnel Required

2

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Grease (WP 0170, Item 16)
Pipe Sealant (WP 0170, Item 22)
Solvent, Cleaning Compound (WP 0170, Item 31)
Lockwasher (1)

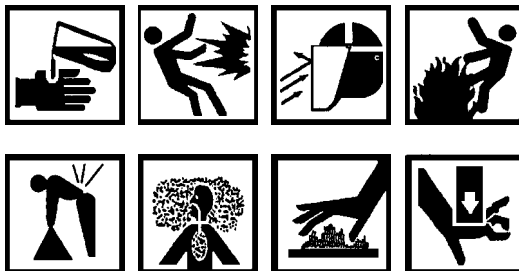
Equipment Conditions

Spare tires removed from gooseneck (WP 0077)
Manual steering straight (WP 0010)
Semitrailer uncoupled from tractor (WP 0013)
Gooseneck lowered to lowest position, if uncoupled (WP 0007)
Front of platform lowered to 36 in. (91.4 cm) (WP 0008)

GENERAL INFORMATION

This work package contains instructions for the removal, inspection, and installation of the gooseneck steering cylinder.

REMOVAL

WARNING

- Hydraulic fluid may be hot if system has been in operation. Allow time for system to cool before performing maintenance.
- Hydraulic fluid may be under pressure. Use caution when disconnecting hydraulic lines or components. Face shields or goggles must be worn.
- Hydraulic fluid may be absorbed through the skin. Avoid prolonged exposure to skin and wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into the eyes, flush them immediately with water and seek medical attention. If hydraulic fluid gets on skin, wash thoroughly with soap and water. Wash hands thoroughly prior to eating or smoking.
- A steering hydraulic cylinder weighs (empty) 110 lb (50 kg). Two personnel must support and lift cylinders from attaching points on gooseneck cylinder mount and spare wheel carrier.
- On some semitrailers a solar battery charger is mounted to the top of the gooseneck directly in front of spare tires. Persons working on top of gooseneck must take **EXTREME** care not to step on the gooseneck or trip over it.
- Use caution during cylinder removal to avoid hands becoming pinched.

Failure to follow these warnings may result in serious injury or death to personnel or damage to equipment.

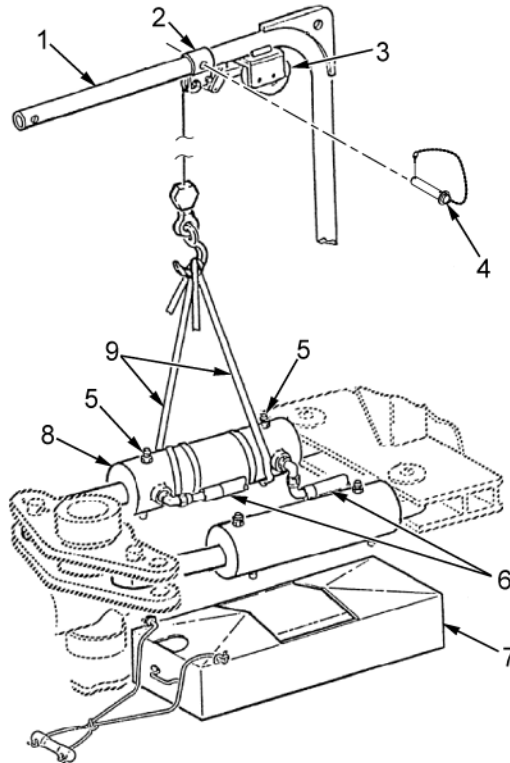
CAUTION

All fittings and openings must be capped and plugged immediately after opening to prevent dirt, moisture, or foreign material from entering the hydraulic system or damage to equipment may result.

NOTE

Use the following procedure for either curbside or streetside gooseneck steering cylinder. Repeat this procedure as necessary for other cylinder repairs.

1. Place drain pan (Figure 1, Item 7) under gooseneck steering cylinders (Figure 1, Item 8). Loosen two bleed valves (Figure 1, Item 5) on steering cylinder to relieve pressure from cylinder.
2. Position drain pan (Figure 1, Item 7) under gooseneck steering cylinder (Figure 1, Item 8). Tag, disconnect, and drain two nonmetallic hoses (Figure 1, Item 6). Install caps/plugs into all openings.
3. Remove hitch pin (Figure 1, Item 4) from winch cable pulley clamp (Figure 1, Item 2) and reposition pulley clamp on davit arm (Figure 1, Item 1) near davit winch (Figure 1, Item 3). Insert hitch pin to secure pulley clamp.
4. Wrap lifting strap (Figure 1, Item 9) around steering cylinder (Figure 1, Item 8) between bleed valves (Figure 1, Item 5). Attach lifting strap to hook from davit arm (Figure 1, Item 1).



HETT0422

Figure 1. Relieve Pressure from Cylinders.

5. Remove lubrication fitting (Figure 2, Item 8), special bolt (Figure 2, Item 7), and sleeve bushing (Figure 2, Item 6) from spare wheel carrier (Figure 2, Item 5). Discard special bolt. Remove and discard lockwasher if present.
6. Remove nonmetallic seals (Figure 2, Item 4) from sleeve bushing (Figure 2, Item 6). Discard nonmetallic seals.
7. Remove button-head screw (Figure 2, Item 2) from pin assembly (Figure 2, Item 3). Drive pin assembly out of spare wheel carrier (Figure 2, Item 5).
8. Remove nonmetallic seals (Figure 2, Item 4) from pin assembly (Figure 2, Item 3). Discard nonmetallic seals.
9. Remove screw (Figure 2, Item 19), lockwasher (Figure 2, Item 18), and rod end connector (Figure 2, Item 17) from straight shoulder pin (Figure 2, Item 16). Discard lockwasher.
10. Remove self-locking nut (Figure 2, Item 13), pin support (Figure 2, Item 12), top clamp (Figure 2, Item 21), and bolt (Figure 2, Item 20) from steering column housing (Figure 2, Item 15).
11. Remove lubrication fitting (Figure 2, Item 14) from straight shoulder pin (Figure 2, Item 16).
12. Drive straight shoulder pin (Figure 2, Item 16) from steering cylinder (Figure 2, Item 9) and steering column housing (Figure 2, Item 15).

NOTE

The steering cylinder may need to be compressed slightly to allow for removal.

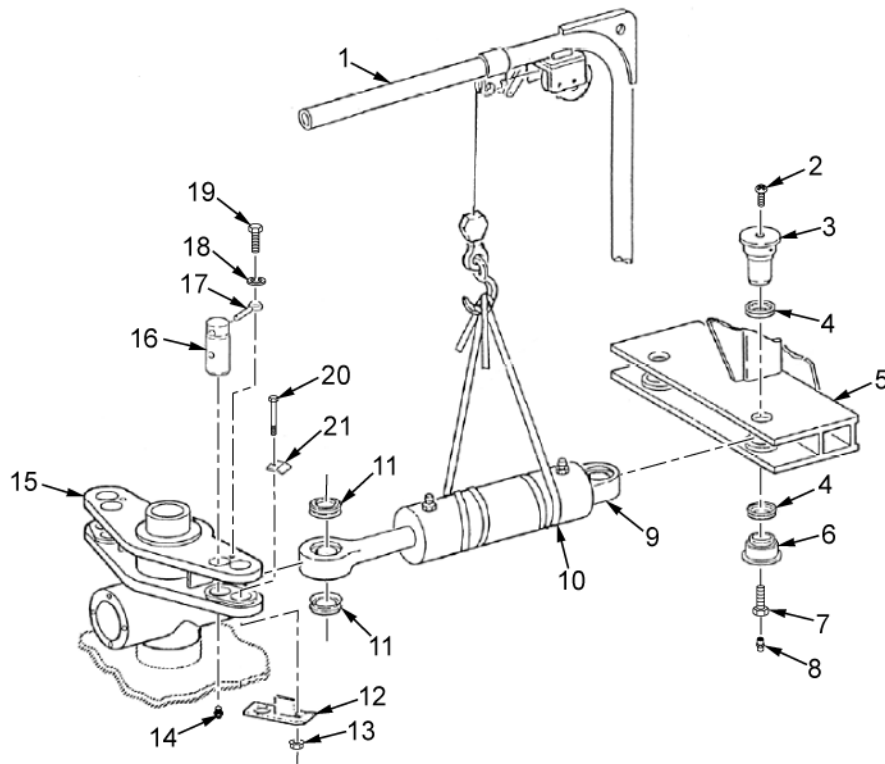
13. If necessary, remove caps from both ports on steering cylinder (Figure 2, Item 9). Allow fluid to drain from cylinder into drain pan and, using crowbar, compress steering cylinder. Reinstall caps onto ports on steering cylinder.

NOTE

The two ring spacers may fall to the ground while steering cylinder is being removed.

14. Use two personnel and davit arm (Figure 2, Item 1) to maneuver steering cylinder (Figure 2, Item 9) down and away from steering column housing (Figure 2, Item 15) and spare wheel carrier (Figure 2, Item 5).
15. Pick up or remove two ring spacers (Figure 2, Item 11) from steering cylinder (Figure 2, Item 9). Discard ring spacers.

16. Continue lowering steering cylinder (Figure 2, Item 9) down to the ground and remove strap (Figure 2, Item 10).



HETT0423

Figure 2. Lifting Steering Cylinder.

END OF TASK

INSPECTION

WARNING**SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
- The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound.
- Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.

Failure to follow these warnings may result in injury or death to personnel.

1. Clean all parts removed in degreaser tank using cleaning compound solvent. Use crocus cloth to remove any nicks, scoring, or burrs from polished or machined surfaces.
2. Inspect steering cylinder and related parts for gouges, cracks, bends, and defects. Replace related parts if found defective. If steering cylinder is defective, replace as required.

END OF TASK

INSTALLATION

1. Wrap lifting strap (Figure 3, Item 4) around steering cylinder (Figure 3, Item 5) and attach both ends of strap to hook on davit arm (Figure 3, Item 3).
2. Align and install suspension mandrel (Figure 3, Item 2) into piston side of steering cylinder (Figure 3, Item 5).

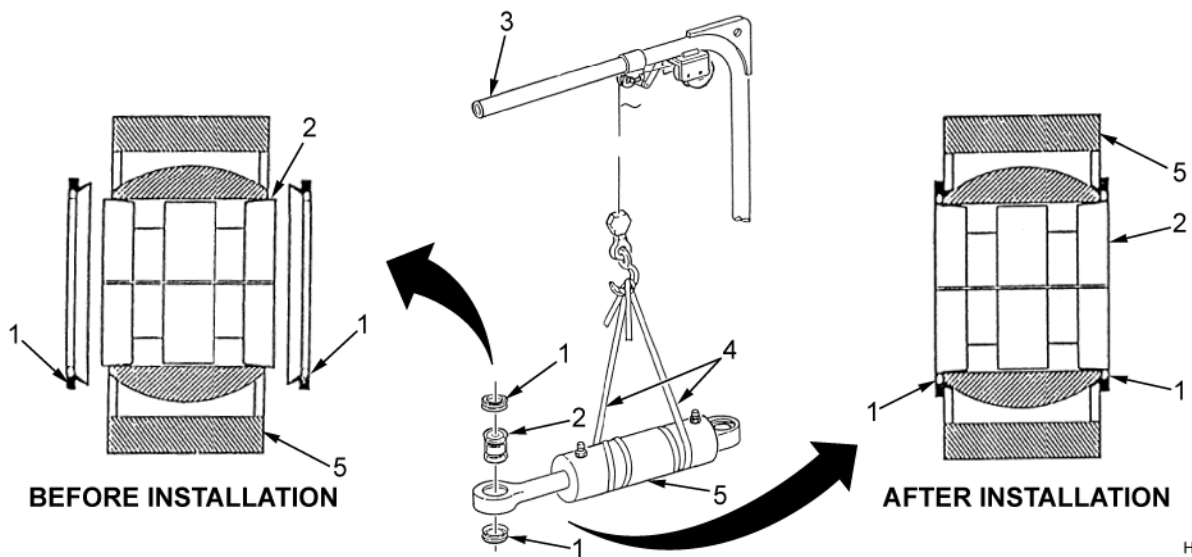
CAUTION

Both ring spacers must be completely compressed and must uniformly cover/expand over bearing of steering cylinder prior to tightening suspension mandrel, or there will not be enough clearance available for installation, and damage to equipment may result.

NOTE

Each ring spacer is actually made of two pieces that can become separated if not handled carefully.

3. Align two ring spacers (Figure 3, Item 1) over each end of suspension mandrel (Figure 3, Item 2). Compress each ring spacer flush onto bearing of steering cylinder (Figure 3, Item 5) and tighten adjusting bolt on suspension mandrel to secure spacers in place.



HETT0424

Figure 3. Alignment and Installation of Suspension Mandrel.

WARNING

On some semitrailers a solar battery charger is mounted to the top of the gooseneck directly in front of spare tires. Persons working on top of gooseneck must take EXTREME care not to step on the gooseneck or trip over it. Failure to follow this warning may result in serious injury to personnel or damage to equipment.

4. Use two personnel, davit arm (Figure 4, Item 1), and straps (Figure 4, Item 10) to maneuver steering cylinder (Figure 4, Item 9) to a height even with cylinder mounts on both steering column housing (Figure 4, Item 15) and spare wheel carrier (Figure 4, Item 5).

CAUTION

When installing the steering cylinder to the steering column housing, ensure ring spacers do not work loose or become misaligned. If spacers are misaligned or become loose, stop the installation and remove the steering cylinder or damage to the spacers may result. It may take a few attempts to accomplish proper spacer installation.

5. Carefully maneuver piston end of steering cylinder (Figure 4, Item 9) into steering column housing (Figure 4, Item 15). Check condition of both ring spacers during entire installation.

NOTE

During installation of piston end of steering cylinder, one person can observe the position of the cylinder by looking through the hole in the steering column housing.

6. Once steering cylinder (Figure 4, Item 9) is in place, loosen adjusting bolt on suspension mandrel (Figure 4, Item 11).

WARNING

- Adhesives, solvents, and sealing compounds may burn easily, may give off harmful vapors, and are harmful to skin and clothing. Keep away from open flames and use in well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.
- On direct contact, uncured silicone sealant irritates eyes. In case of contact, flush eyes with water and seek medical attention. In case of skin contact, wipe off and flush with water.

Failure to follow this warning may result in injury or death to personnel.

NOTE

After the suspension mandrel is loosened, the mandrel will be driven out of the steering cylinder while installing the straight shouldered pin.

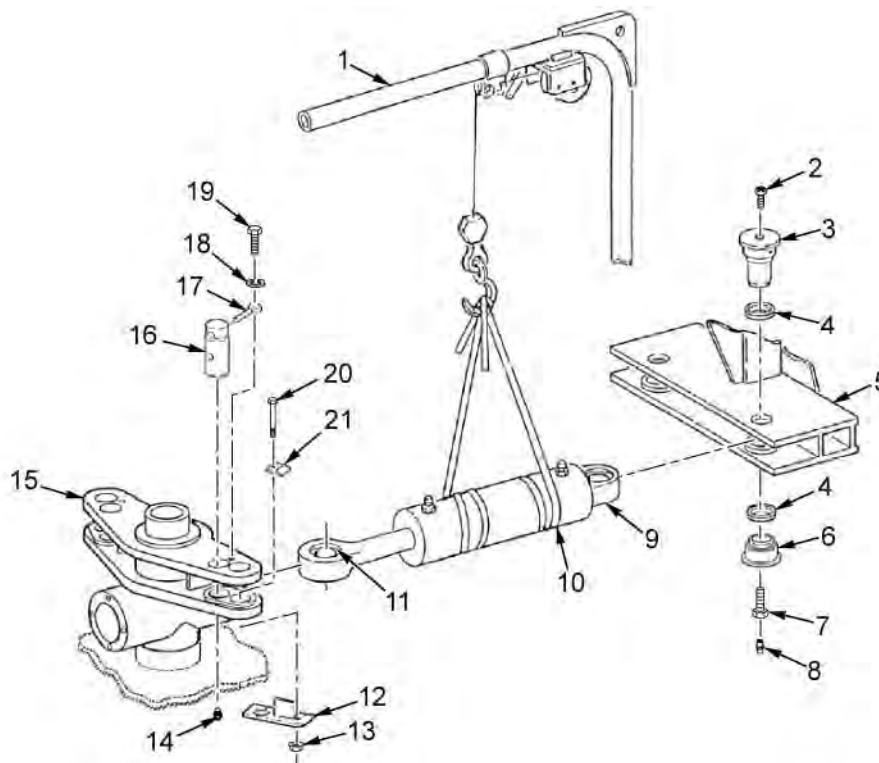
7. Apply grease to straight shouldered pin (Figure 4, Item 16). Align and install rod end connector (Figure 4, Item 17) into straight shouldered pin. Position pin so that hole for rod end connector is aligned. Install straight shouldered pin through inboard hole in top of steering column housing (Figure 4, Item 15) and steering cylinder (Figure 4, Item 9). Remove suspension mandrel (Figure 4, Item 11).

8. Secure rod end connector (Figure 4, Item 17) with screw (Figure 4, Item 19) and lockwasher (Figure 4, Item 18).
9. Install lubrication fitting (Figure 4, Item 14) into straight shouldered pin (Figure 4, Item 16).
10. Install top clamp (Figure 4, Item 21), bolt (Figure 4, Item 20), pin support (Figure 4, Item 12), and self-locking nut (Figure 4, Item 13).
11. Remove caps from both ports on steering cylinder (Figure 4, Item 9) and, using a crowbar and two personnel, extend steering cylinder so that bearing in steering cylinder is approximately aligned with holes in spare wheel carrier (Figure 4, Item 5).
12. Install caps onto ports of steering cylinder (Figure 4, Item 9).
13. Use two personnel to maneuver steering cylinder (Figure 4, Item 9) into spare wheel carrier (Figure 4, Item 5).

CAUTION

DO NOT apply grease to inner wear surface of sleeve bushing. It may get onto bolt threads, reversing the effect of thread locking compound and causing damage to equipment.

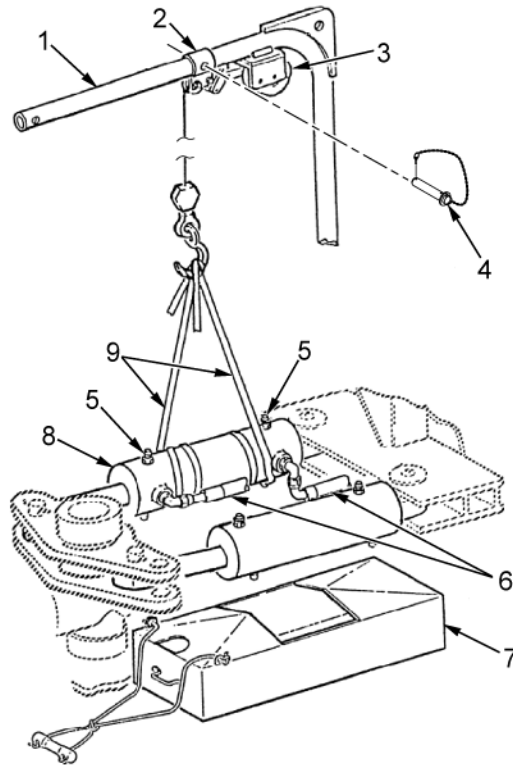
14. Install button-head screw (Figure 4, Item 2) into pin assembly (Figure 4, Item 3). Apply grease to two nonmetallic seals (Figure 4, Item 4) and apply grease to exterior of pin assembly and exterior of sleeve bushing (Figure 4, Item 6).
15. Install nonmetallic seals (Figure 4, Item 4) onto pin assembly (Figure 4, Item 3) and sleeve bushing (Figure 4, Item 6).
16. Align and install pin assembly (Figure 4, Item 3) through spare wheel carrier (Figure 4, Item 5) and steering cylinder (Figure 4, Item 9).
17. Install sleeve bushing (Figure 4, Item 6) onto pin assembly (Figure 4, Item 3). Secure sleeve bushing by installing new self-locking special bolt (Figure 4, Item 7). Use torque wrench to torque new special bolt to 100 to 110 lb-ft (136 to 149 Nm).
18. Install lubrication fitting (Figure 4, Item 8) into new special bolt (Figure 4, Item 7).



HETT0916

Figure 4. Maneuvering Steering Cylinder.

19. Remove hook from strap (Figure 5, Item 9) on steering cylinder (Figure 5, Item 8) and on davit arm (Figure 5, Item 1).
20. Remove hitch pin (Figure 5, Item 4) from winch cable pulley clamp (Figure 5, Item 2) and move pulley clamp to davit winch (Figure 5, Item 3) to stow position at end of davit (Figure 5, Item 1). Install and secure hitch pin.
21. Remove caps/plugs and drain pan (Figure 5, Item 7) and reconnect two nonmetallic hoses (Figure 5, Item 6) to steering cylinder (Figure 5, Item 8). Close bleed valves (Figure 5, Item 5).



HETT0422

Figure 5. Connecting Steering Cylinder.

END OF TASK

FOLLOW-ON MAINTENANCE

- Bleed air from hydraulic system (WP 0041).
- Perform required lubrication (WP 0163).
- Couple tractor/semitrailer (WP 0013).
- Operate steering and check for improper operation (WP 0010).
- Install spare tires (WP 0077).

END OF WORK PACKAGE

FIELD MAINTENANCE**GOOSENECK STEPS**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)

Locknut (2)

Personnel Required

1

Materials/Parts

Cotter Pin (1)

Cotter Pin (2)

Locknut (2)

Locknut (6)

Locknut (2)

Equipment ConditionsGooseneck adjusted to 64 in. (162.5 cm) height (WP 0007)
or coupled to tractor (WP 0013)

GENERAL INFORMATION

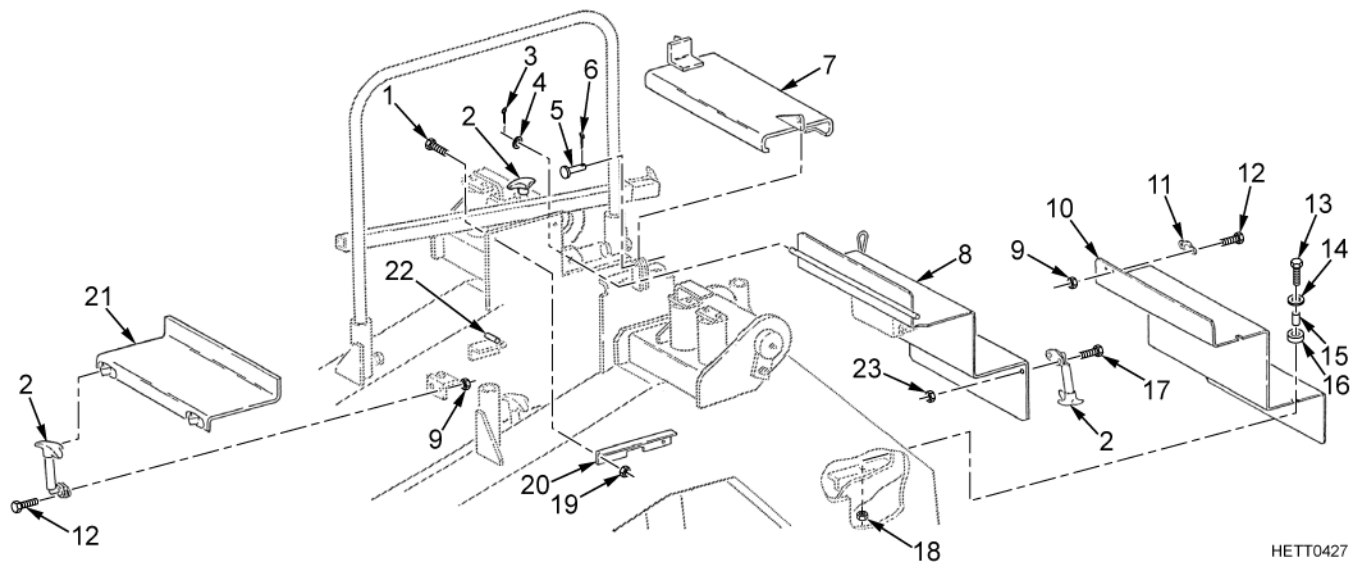
This work package contains instructions for the removal and installation of the gooseneck steps.

REMOVAL**WARNING**

- **When on top of the gooseneck and removing or installing gooseneck steps, always hold onto the semitrailer with one hand or injury to personnel may result.**
- **On some semitrailers a solar battery charger is mounted to the top of the gooseneck directly in front of spare tires. Persons working on top of the gooseneck must take EXTREME care not to step on the gooseneck or trip over it.**

Failure to follow these warnings may result in injury to personnel or damage to equipment.

1. Unhook two latches (Figure 1, Item 2) from step assembly (Figure 1, Item 21). Lift forward edge of step assembly up and pull forward to disengage step from pins (Figure 1, Item 22).
2. Unhook latch (Figure 1, Item 2). Remove cotter pin (Figure 1, Item 6), pin (Figure 1, Item 5), and step assembly (Figure 1, Item 7). Discard cotter pin.
3. Remove two locknuts (Figure 1, Item 19), bolts (Figure 1, Item 1), and step support (Figure 1, Item 20) from gooseneck weldment. Discard locknuts.
4. Remove two cotter pins (Figure 1, Item 3) and washers (Figure 1, Item 4) from upper step section (Figure 1, Item 8). Unhook latch (Figure 1, Item 2) and remove upper step section. Discard cotter pins.
5. Remove three nuts (Figure 1, Item 18), spacers (Figure 1, Item 16), spacers (Figure 1, Item 15), washers (Figure 1, Item 14), screws (Figure 1, Item 13), and lower step section (Figure 1, Item 10).
6. Remove six locknuts (Figure 1, Item 9), screws (Figure 1, Item 12), two latches (Figure 1, Item 2), and latch attached to gooseneck weldments. Discard locknuts.
7. Remove two locknuts (Figure 1, Item 23), screws (Figure 1, Item 17), and latch (Figure 1, Item 2) from upper step section (Figure 1, Item 8). Discard locknuts.
8. Remove two locknuts (Figure 1, Item 9), screws (Figure 1, Item 12), and plate (Figure 1, Item 11) from lower step section (Figure 1, Item 10). Discard locknuts.
9. Position plate (Figure 1, Item 11) on lower step section (Figure 1, Item 10) and secure with two screws (Figure 1, Item 12) and new locknuts (Figure 1, Item 9).
10. Position latch (Figure 1, Item 2) on upper step section (Figure 1, Item 8) and secure with two screws (Figure 1, Item 17) and new locknuts (Figure 1, Item 23).
11. Position two latches (Figure 1, Item 2) on gooseneck weldment bracket and secure each latch with two screws (Figure 1, Item 12) and new locknuts (Figure 1, Item 9).
12. Position latch (Figure 1, Item 2) on gooseneck step weldment and secure with two screws (Figure 1, Item 12) and new locknuts (Figure 1, Item 9).



HETT0427

Figure 1. Gooseneck Steps Removal.

END OF TASK

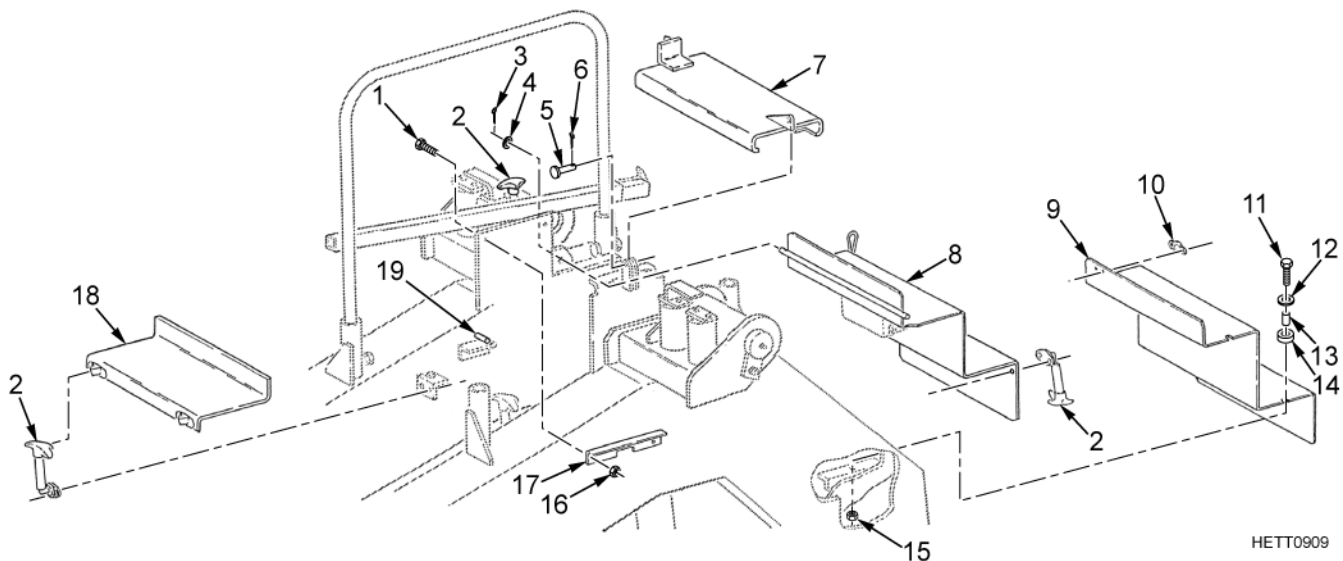
INSTALLATION

1. Install lower step section (Figure 2, Item 9) and secure with three screws (Figure 2, Item 11), washers (Figure 2, Item 12), spacers (Figure 2, Item 13), spacers (Figure 2, Item 14), and new locknuts (Figure 2, Item 15).

NOTE

On newer upper step sections, the mounting rod may have two holes in each end. In this case, install two washers and two cotter pins at streetside only.

2. Install upper step section (Figure 2, Item 8) and secure with two washers (Figure 2, Item 4) and new cotter pins (Figure 2, Item 3). Hook latch (Figure 2, Item 2) onto plate (Figure 2, Item 10).
3. Position step support (Figure 2, Item 17) on gooseneck step weldment and secure with two bolts (Figure 2, Item 1) and new locknuts (Figure 2, Item 16).
4. Install step (Figure 2, Item 7) and secure with pin (Figure 2, Item 5) and new cotter pin (Figure 2, Item 6). Hook latch (Figure 2, Item 2) onto step.
5. Install step (Figure 2, Item 18) by inserting rear lip under pins (Figure 2, Item 19) and rotating step downward. Secure step by hooking two latches (Figure 2, Item 2).



HETT0909

Figure 2. Gooseneck Steps Installation.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
GOOSENECK GUARDRAILS

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)

Personnel Required

1

Materials/Parts

Lockwashers (2)

Self-Locking Nut (2)

Self-Locking Nut (2)

Equipment ConditionsGooseneck lowered to lowest position, if uncoupled
(WP 0007)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the gooseneck guardrails.

REMOVAL**WARNING**

- When on top of the gooseneck and removing or installing guardrails, always hold onto the semitrailer with one hand or injury to personnel may result.
- On some semitrailers a solar battery charger is mounted to the top of the gooseneck directly in front of spare tires. Persons working on top of the gooseneck must take **EXTREME** care not to step on the gooseneck or trip over it.

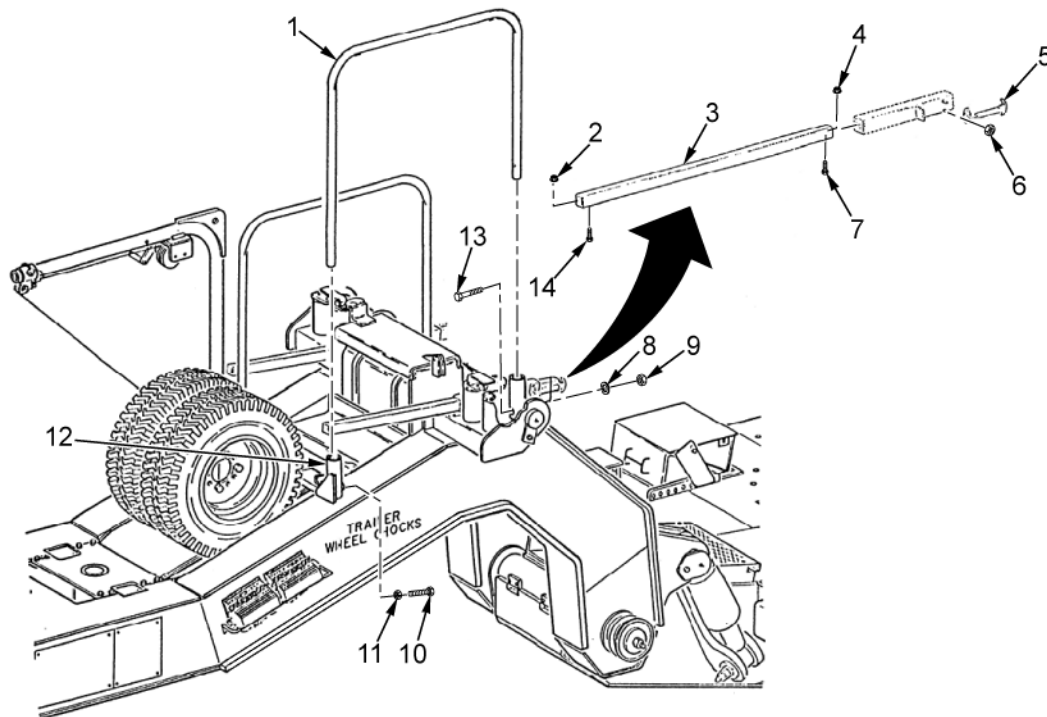
Failure to follow these warnings may result in injury to personnel or damage to equipment.

NOTE

Use the following procedure for either the streetside or curbside guardrail. Repeat this procedure as required to complete the necessary repairs.

1. Remove nut (Figure 1, Item 9), lockwasher (Figure 1, Item 8), and capscrew (Figure 1, Item 13) from gooseneck. Discard lockwasher.
2. Loosen jam nut (Figure 1, Item 11) and remove capscrew (Figure 1, Item 10) with jam nut from gooseneck.
3. Lift guardrail (Figure 1, Item 1) straight up out of gooseneck support weldments (Figure 1, Item 12) on gooseneck.
4. Remove self-locking nut (Figure 1, Item 2) and bolt (Figure 1, Item 14). Remove gooseneck safety rail (Figure 1, Item 3) from weldment. Discard self-locking nut.

5. Remove self-locking nut (Figure 1, Item 4), bolt (Figure 1, Item 7), two self-locking nuts (Figure 1, Item 6), and latch (Figure 1, Item 5). Discard self-locking nuts.



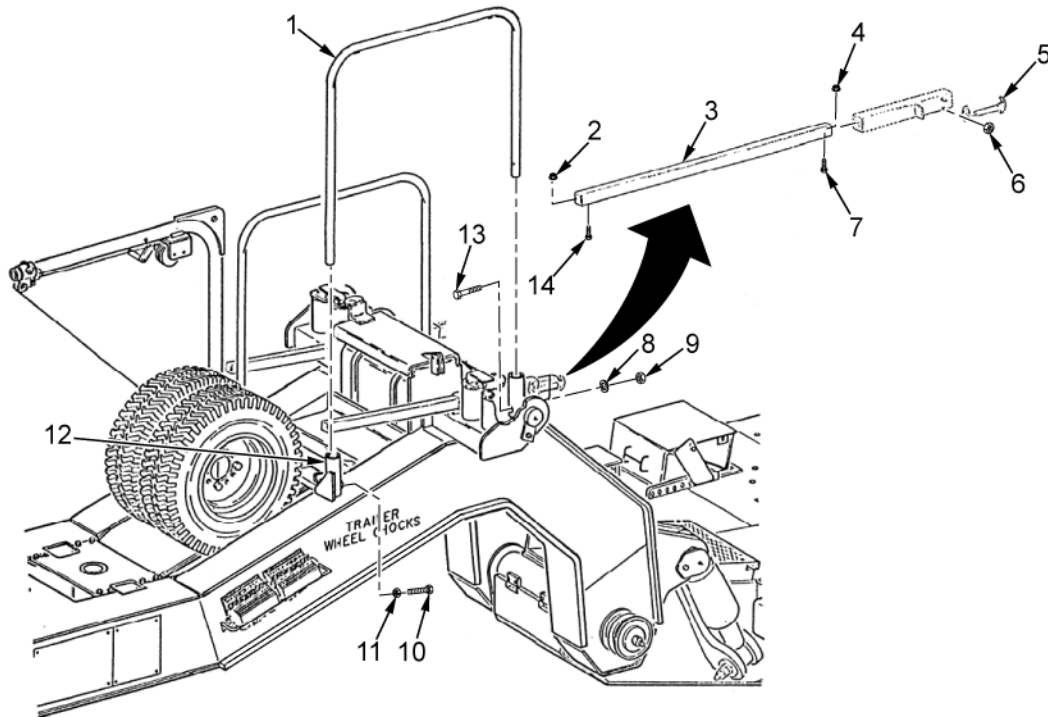
HETT0428

Figure 1. Gooseneck Guardrails Removal.

END OF TASK

INSTALLATION

1. Insert legs of guardrail (Figure 2, Item 1) in gooseneck support weldments (Figure 2, Item 12) on gooseneck.
2. Place jam nut (Figure 2, Item 11) on capscrew (Figure 2, Item 10) and install capscrew on gooseneck.
3. Install capscrew (Figure 2, Item 13), lockwasher (Figure 2, Item 8), and nut (Figure 2, Item 9) on gooseneck.
4. Install latch (Figure 2, Item 5), two self-locking nuts (Figure 2, Item 6), bolt (Figure 2, Item 7), and self-locking nut (Figure 2, Item 4).
5. Install gooseneck safety rail (Figure 2, Item 3) into gooseneck support weldment (Figure 2, Item 12) and install bolt (Figure 2, Item 14) and self-locking nut (Figure 2, Item 2).



HETT0428

Figure 2. Installation of Safety Rail.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**GRAB HANDLE**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)

Equipment Conditions

Gooseneck lowered as required so that grab handle can be reached (WP 0007)

Materials/Parts

Locknut (2)

Personnel Required

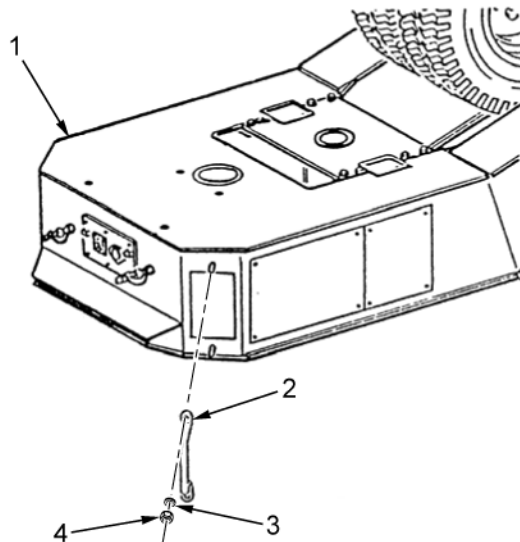
1

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the grab handle.

REMOVAL

1. Remove two locknuts (Figure 1, Item 4), washers (Figure 1, Item 3), and grab handle (Figure 1, Item 2) from gooseneck (Figure 1, Item 1). Discard locknuts.



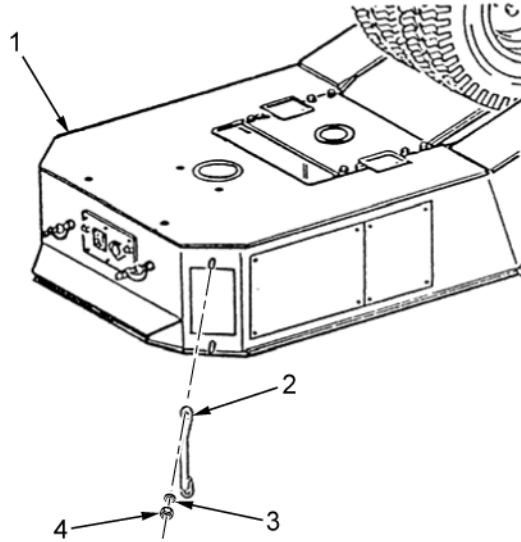
HETT0429

Figure 1. Grab Handle Removal.

END OF TASK

INSTALLATION

1. Install grab handle (Figure 2, Item 2) onto gooseneck (Figure 2, Item 1) with two washers (Figure 2, Item 3) and new locknuts (Figure 2, Item 4).



HETT0429

Figure 2. Grab Handle Installation.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
PLATFORM STEPS AND SERVICE COVERS

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)

Materials/Parts

Cotter Pin (24)

Lockwasher (32)

D-Ring (1)

Personnel Required

1

Equipment Conditions

ISO container lock mounts removed from platform
(WP 0026)

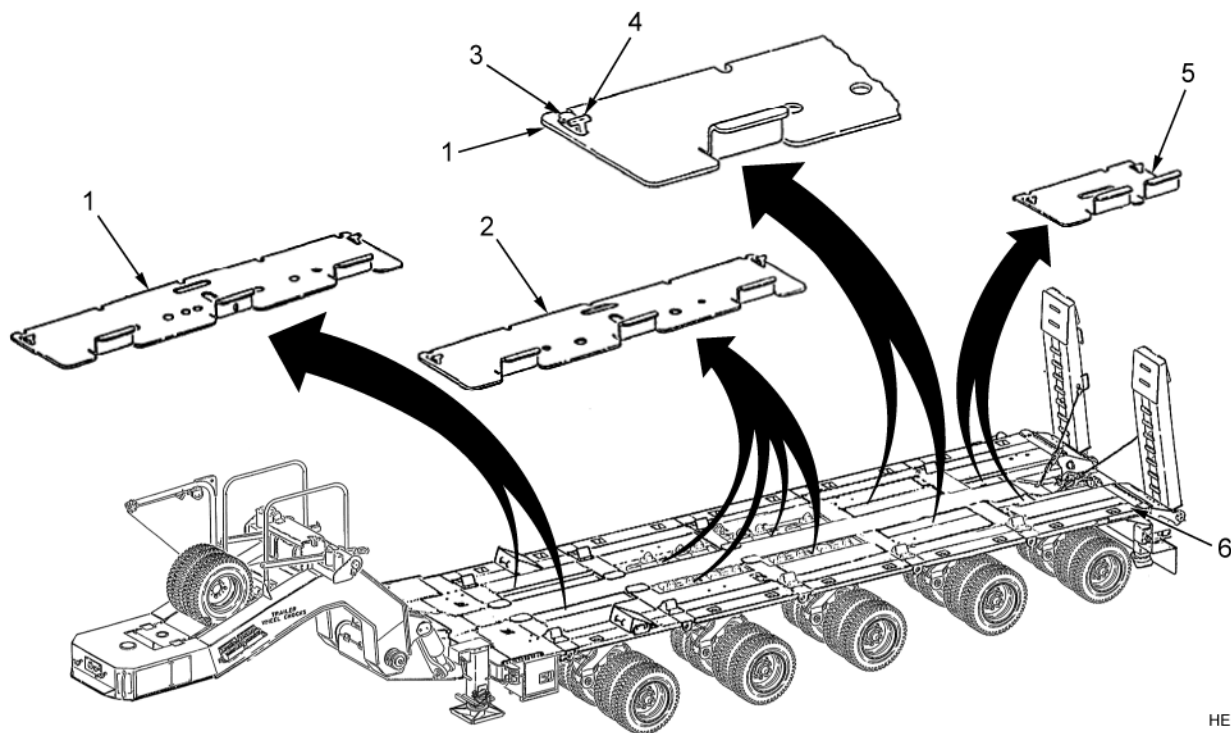
Curb guides removed from platform (WP 0015)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the platform steps and service covers.

REMOVAL

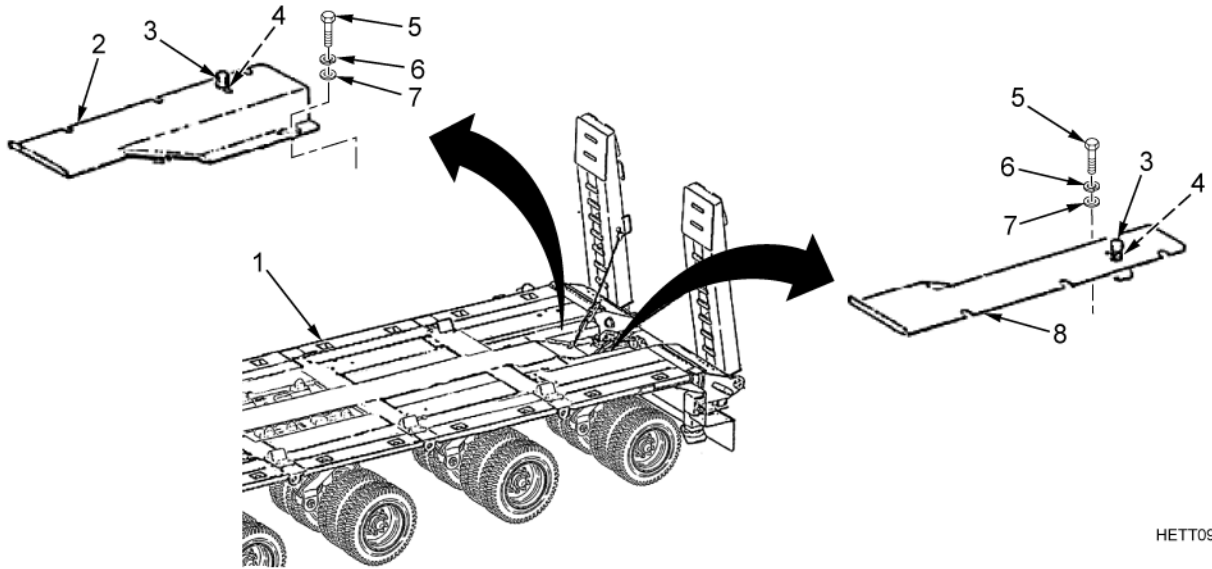
1. Loosen capscrew (Figure 1, Item 3) and slide retainer (Figure 1, Item 4) inboard. Lift up and remove four service covers (Figure 1, Item 1), four service covers (Figure 1, Item 2), or two service covers (Figure 1, Item 5) from platform (Figure 1, Item 6). Repeat this step as necessary for each service cover to be removed.



HETT0910

Figure 1. Service Cover Removal.

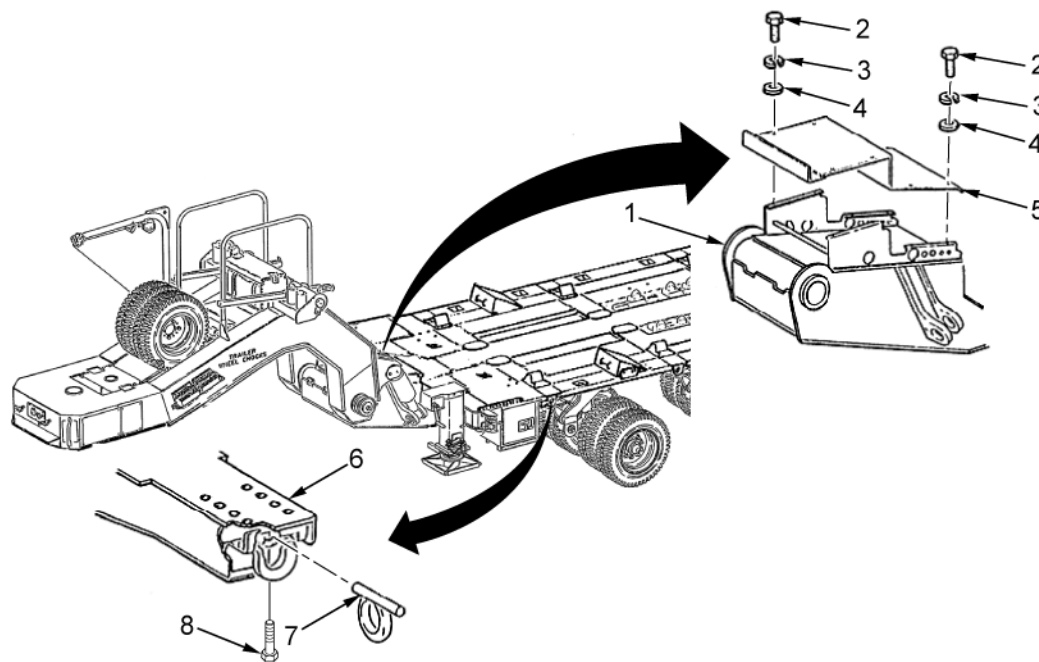
2. Loosen capscrew (Figure 2, Item 3) and slide retainer (Figure 2, Item 4) inboard. Remove capscrew (Figure 2, Item 5), lockwasher (Figure 2, Item 6), and washer (Figure 2, Item 7) from service cover (Figure 2, Item 2 or Item 8). Lift up and remove service cover (Figure 2, Item 2) or service cover (Figure 2, Item 8) from platform (Figure 2, Item 1). Repeat this step as necessary for each service cover to be removed.



HETT0911

Figure 2. Service Cover Removal.

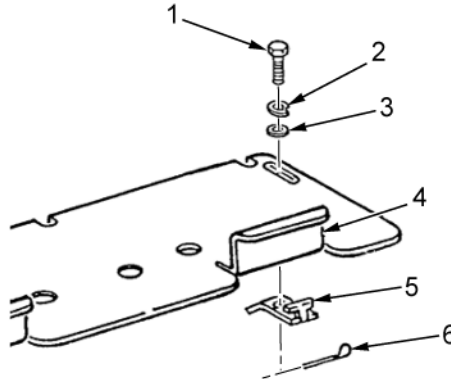
3. Remove eight capscrews (Figure 3, Item 2), lockwashers (Figure 3, Item 3), and washers (Figure 3, Item 4) from platform step section (Figure 3, Item 5). Remove platform step section from platform weldment (Figure 3, Item 1). Discard lockwashers.
4. Remove screw (Figure 3, Item 8). Lift and twist D-ring (Figure 3, Item 7) to remove from platform weldment (Figure 3, Item 6). Repeat this step as required for each D-ring to be removed.



HETT0912

Figure 3. Platform Step Section Removal.

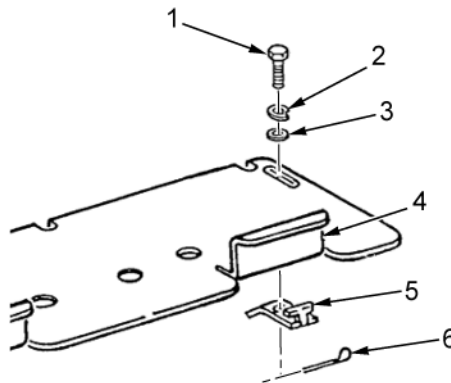
5. Remove cotter pin (Figure 4, Item 6), capscrew (Figure 4, Item 1), lockwasher (Figure 4, Item 2), washer (Figure 4, Item 3), and retainer (Figure 4, Item 5) from service cover (Figure 4, Item 4). Discard lockwasher and cotter pin. Repeat this step as necessary for each service cover being disassembled.



HETT0431

Figure 4. Service Cover Removal.

6. Install retainer (Figure 5, Item 5) to service cover (Figure 5, Item 4) and secure with washer (Figure 5, Item 3) and lockwasher (Figure 5, Item 2), and loosely install capscrew (Figure 5, Item 1). Align and install cotter pin (Figure 5, Item 6) into capscrew. Repeat this step for each service cover that was disassembled.



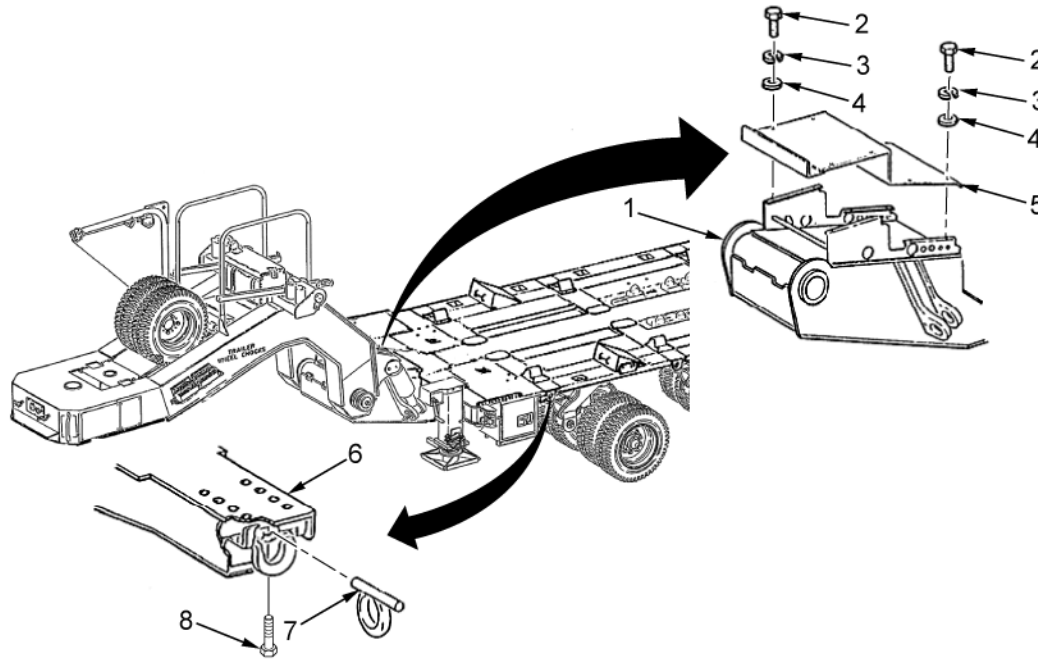
HETT0431

Figure 5. Service Cover Removal.

END OF TASK

INSTALLATION

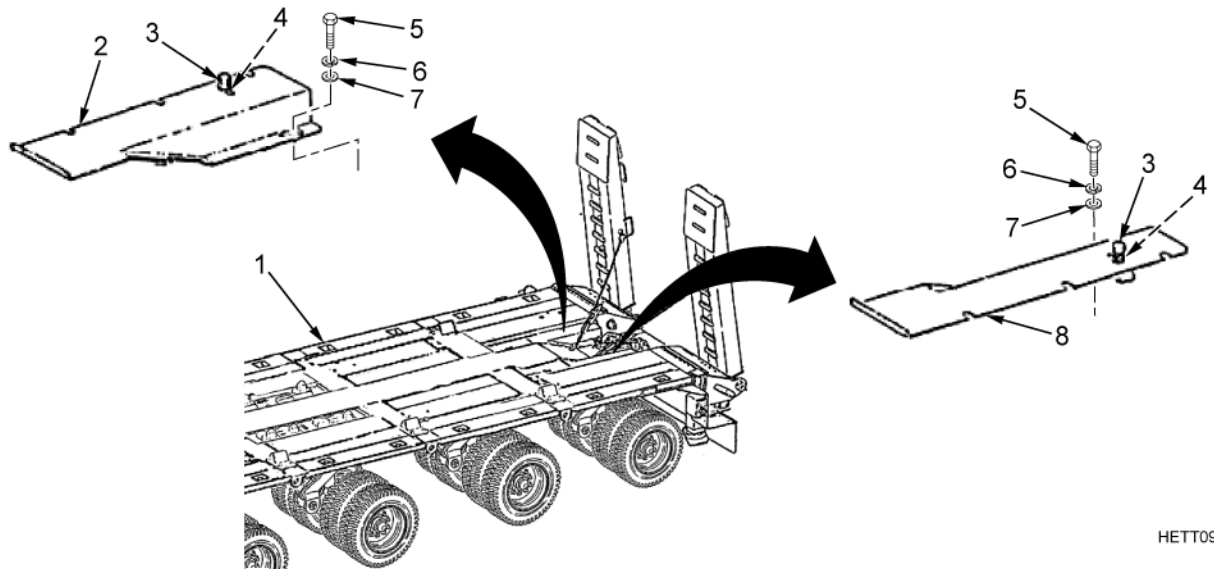
1. Install D-ring (Figure 6, Item 7) in position on platform weldment (Figure 6, Item 6) and secure with screw (Figure 6, Item 8). Repeat this step for each D-ring to be installed.
2. Install platform step section (Figure 6, Item 5) in position on platform weldment (Figure 6, Item 1). Secure step section in place by installing eight washers (Figure 6, Item 4), lockwashers (Figure 6, Item 3), and capscrews (Figure 6, Item 2).



HETT0912

Figure 6. Platform Step Section Installation.

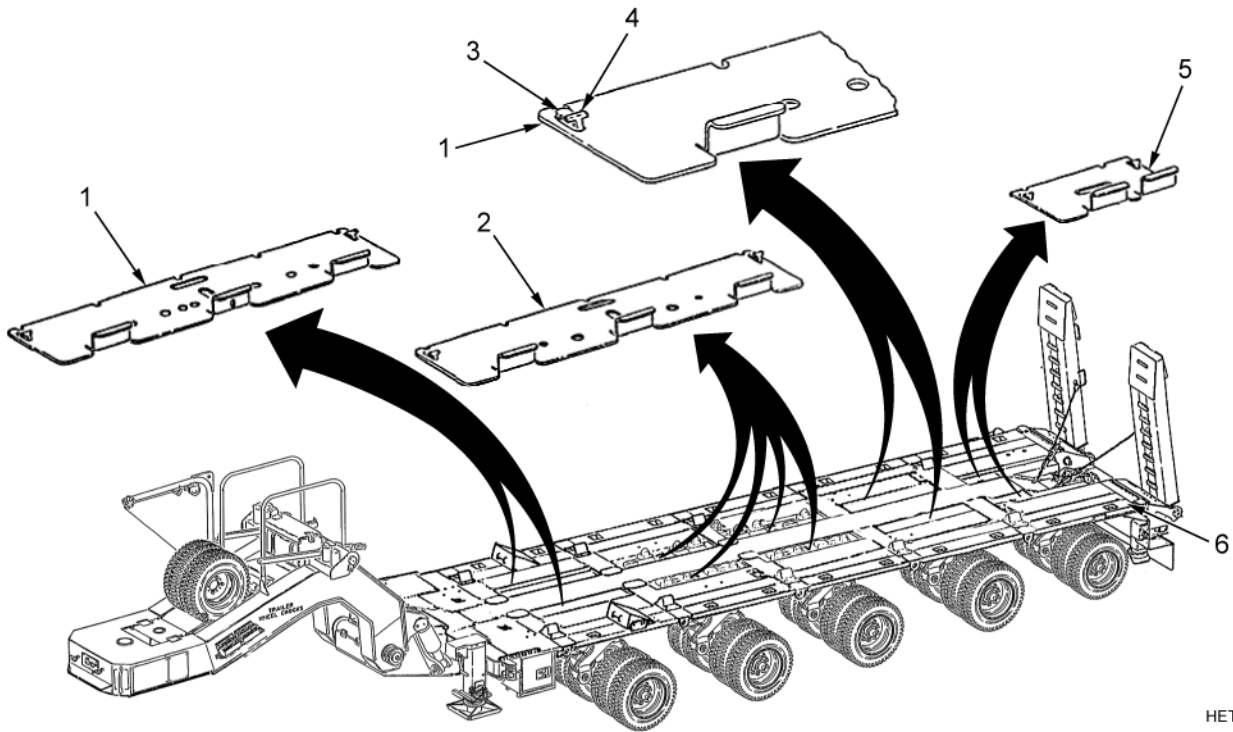
3. To install service cover (Figure 7, Item 2 or Item 8), position specific cover in appropriate platform opening and slide each retainer (Figure 7, Item 4) aft and outboard until latch secures under edge of platform (Figure 7, Item 1) weldment. Tighten each capscrew (Figure 7, Item 3). Install capscrew (Figure 7, Item 5), lockwasher (Figure 7, Item 6), and washer (Figure 7, Item 7) to secure cover in place. Repeat this procedure for each access cover installed.



HETT0911

Figure 7. Service Cover Installation.

4. To install service cover (Figure 8, Item 1, Item 2, or Item 5), position specific cover in appropriate platform opening and slide two retainers (Figure 8, Item 4) outboard until latch secures under edge of platform (Figure 8, Item 6) weldment. Tighten each capscrew (Figure 8, Item 3) to secure cover in place. Repeat this procedure for each access cover installed.



HETT0910

Figure 8. Service Cover Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Install curb guides (WP 0015).

Install ISO container locks (WP 0026).

END OF WORK PACKAGE

FIELD MAINTENANCE**LOADING RAMPS**

INITIAL SETUP:**Tools and Special Tools**

Chain Assembly, 5/16 in. LK, 11 ft L (WP 0168, Item 8)
General Mechanic's Tool Kit (WP 0168, Item 11)
Truck, Wrecker M984 (WP 0168, Item 26)
Standard Army Tool Set (WP 0168, Item 28)

Lockwasher (4)

QuickLink (as required)

Personnel Required

3

Materials/Parts

Crocus Cloth (WP 0170, Item 6)
Solvent, Cleaning Compound (WP 0170, Item 31)
Wood Block, 2 in. x 4 in. (1)
Locknut (4)
Cotter Pin (2)

Equipment Conditions

Platform at road height (WP 0008)
Gooseneck lowered to lowest position, if uncoupled (WP 0007)
Front and rear support legs lowered supporting platform (WP 0011 and WP 0012)
Crowbar and isolation valve handle extension removed (WP 0002)

GENERAL INFORMATION

This work package contains instructions for the removal, repair, installation, and adjustment of the loading ramps.

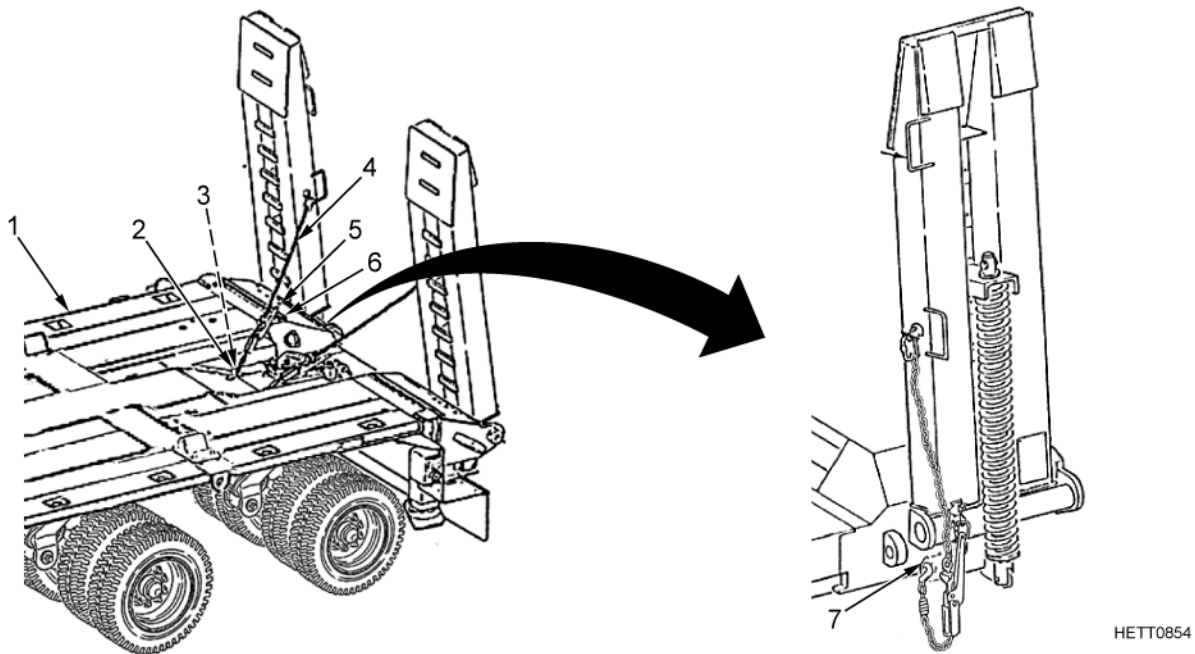
REMOVAL**WARNING**

- **DO NOT** stand behind the ramps or in the path the ramps can travel when being lowered and raised.
 - When ramps are lowered and near horizontal position, the springs are fully compressed and under extreme pressure. **DO NOT** attempt to adjust or remove spring mechanism unless ramps are in the raised (stow) position.
- Failure to follow these warnings may result in serious injury or death to personnel.

NOTE

The procedures for removal/installation of either the curbside or streetside ramps are identical. This procedure represents the curbside ramp. To remove only the ramp spring and associated components, perform steps 1 thru 8.

1. Open snap (Figure 1, Item 5) and load binder (Figure 1, Item 6) of chain assembly (Figure 1, Item 4). Remove chain hook (Figure 1, Item 3) from hole (Figure 1, Item 2) in platform (Figure 1, Item 1). Attach chain hook (Figure 1, Item 3) in hole on ramp lift lever (Figure 1, Item 7).



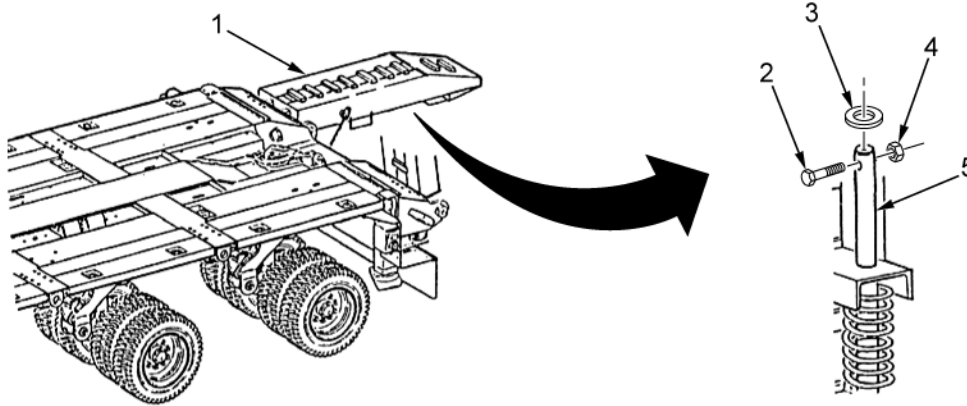
HETT0854

Figure 1. Loading Ramp Removal.

NOTE

Ramp is lowered to horizontal position to permit removal of the capscrew installed through the top end of the spring guide rod.

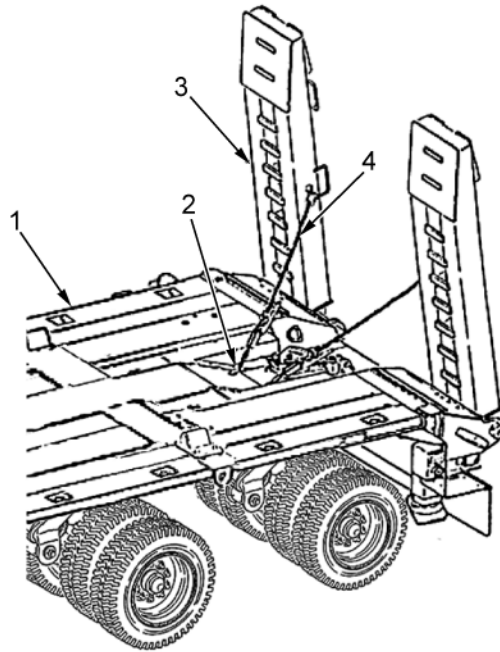
2. Lower ramp (Figure 2, Item 1) to horizontal position (WP 0009).
3. Remove locknut (Figure 2, Item 4), capscrew (Figure 2, Item 2), and washer (Figure 2, Item 3) from upper end of spring guide rod (Figure 2, Item 5). Discard locknut.



HETT0855

Figure 2. Loading Ramp Removal.

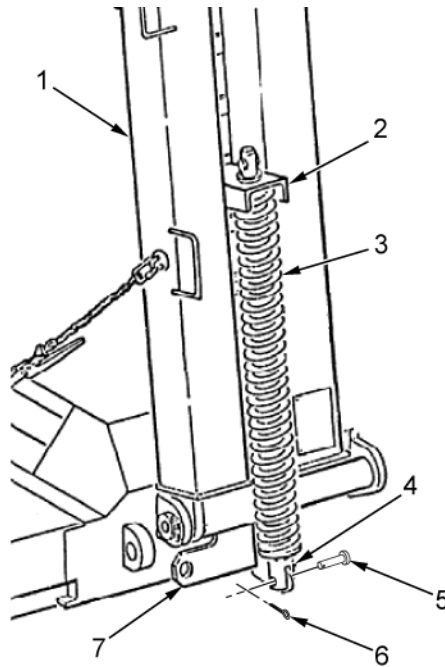
4. Return ramp (Figure 3, Item 3) to raised (stow) position (WP 0009). Reconnect chain assembly (Figure 3, Item 4) to hole (Figure 3, Item 2) in platform (Figure 3, Item 1).



HETT0856

Figure 3. Loading Ramp Removal.

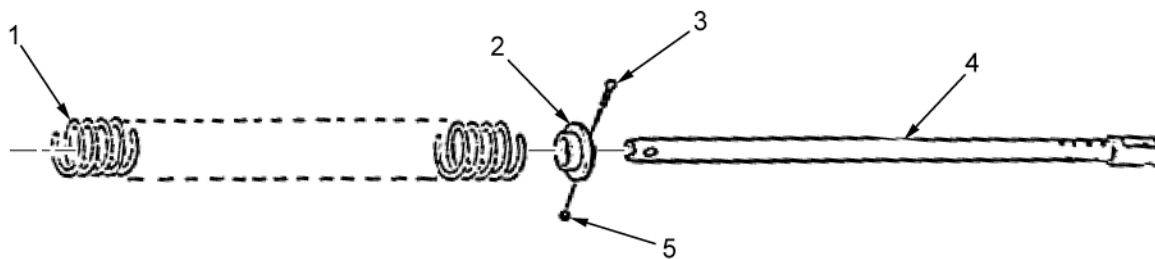
5. Remove cotter pin (Figure 4, Item 6) and shouldered pin (Figure 4, Item 5) from lower end of spring guide rod (Figure 4, Item 4) and ramp lift lever (Figure 4, Item 7). Discard cotter pin.
6. Use two people to remove spring guide rod assembly (Figure 4, Item 3) from ramp (Figure 4, Item 1) by lifting forked end of guide rod (Figure 4, Item 4) off of ramp lift lever (Figure 4, Item 7) and lowering spring guide rod assembly until top of guide rod is free of weldment bracket (Figure 4, Item 2).



HETT0857

Figure 4. Loading Ramp Removal.

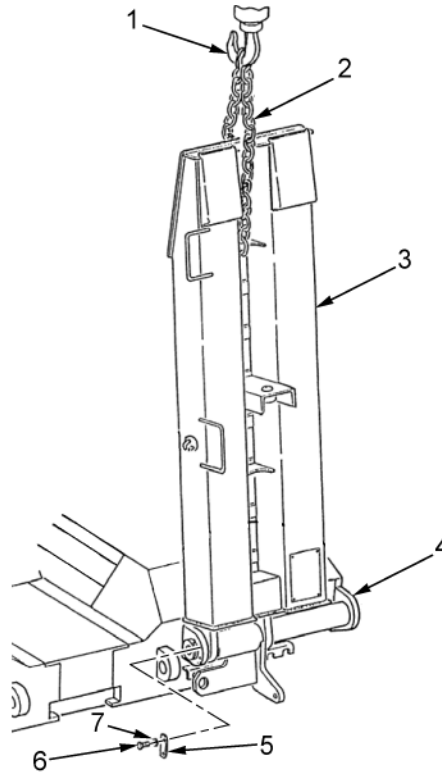
7. Remove spring guide rod (Figure 5, Item 4) from helical compression spring (Figure 5, Item 1).
8. Remove nut (Figure 5, Item 5), capscrew (Figure 5, Item 3), and adjustment fitting (Figure 5, Item 2) from spring guide rod (Figure 5, Item 4).



HETT0858

Figure 5. Loading Ramp Removal.

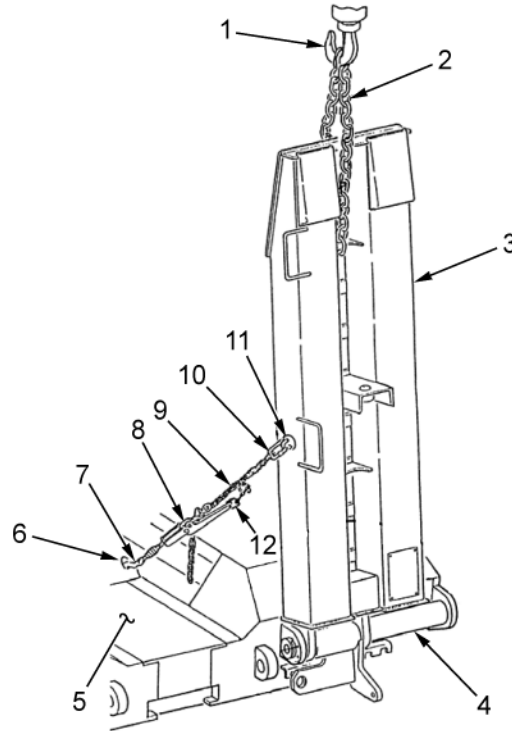
9. Remove two capscrews (Figure 6, Item 6), lockwashers (Figure 6, Item 7), and plate (Figure 6, Item 5) from platform lug weldment (Figure 6, Item 4). Discard lockwashers.
10. Install lifting chain (Figure 6, Item 2) through opening at top of ramp weldment (Figure 6, Item 3) and attach lifting chain to a suitable overhead lifting device (Figure 6, Item 1).
11. Operate lifting device (Figure 6, Item 1) to take up slack in lifting chain (Figure 6, Item 2).



HETT0859

Figure 6. Loading Ramp Removal.

12. Open snap (Figure 7, Item 12) and load binder (Figure 7, Item 8) of chain assembly (Figure 7, Item 9) and remove chain hook (Figure 7, Item 7) from hole (Figure 7, Item 6) in platform (Figure 7, Item 5). Open QuickLink (Figure 7, Item 10) and remove chain assembly from attachment lug (Figure 7, Item 11) on side of ramp (Figure 7, Item 3). Lay chain assembly on platform.
13. Operate lifting device (Figure 7, Item 1) to take weight of ramp (Figure 7, Item 3) off of ramp pivot shaft (Figure 7, Item 4). Keep tension on lifting chain (Figure 7, Item 2).



HETT0860

Figure 7. Loading Ramp Removal.

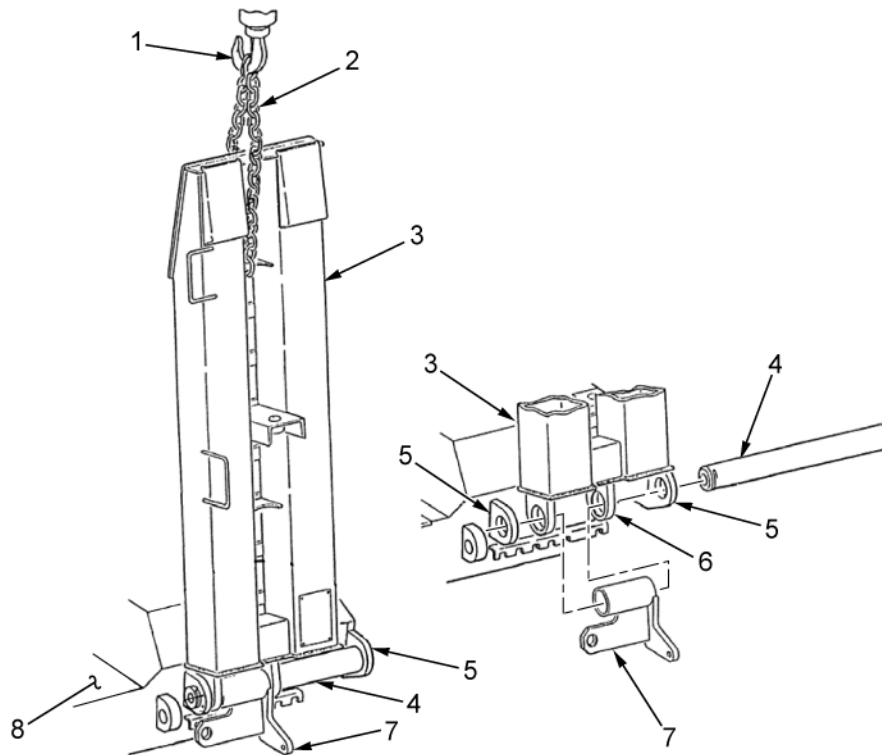
14. Use sledge hammer and short length of 2 in. x 4 in. lumber to drive ramp pivot shaft (Figure 8, Item 4) from inboard side of ramp (Figure 8, Item 3) out of platform weldment (Figure 8, Item 5).

WARNING



The ramp pivot shaft weighs in excess of 140 lb (63.5 kg). Use two people when removing pivot shaft from platform weldment or injury to personnel may result.

15. Use one person to drive out pivot shaft (Figure 8, Item 4) and one person to support ramp lever (Figure 8, Item 7). Continue to drive out ramp pivot shaft in outboard direction until ramp lever and ramp lug weldments (Figure 8, Item 6) are free of pivot shaft.
16. Use two people to remove ramp pivot shaft (Figure 8, Item 4) from remaining platform outboard lug weldment (Figure 8, Item 5).
17. Operate lifting device (Figure 8, Item 1) to lower ramp (Figure 8, Item 3) onto platform (Figure 8, Item 8) or suitable pallet. Remove lifting device and lifting chain (Figure 8, Item 2) from ramp.



HETT0861

Figure 8. Loading Ramp Removal.

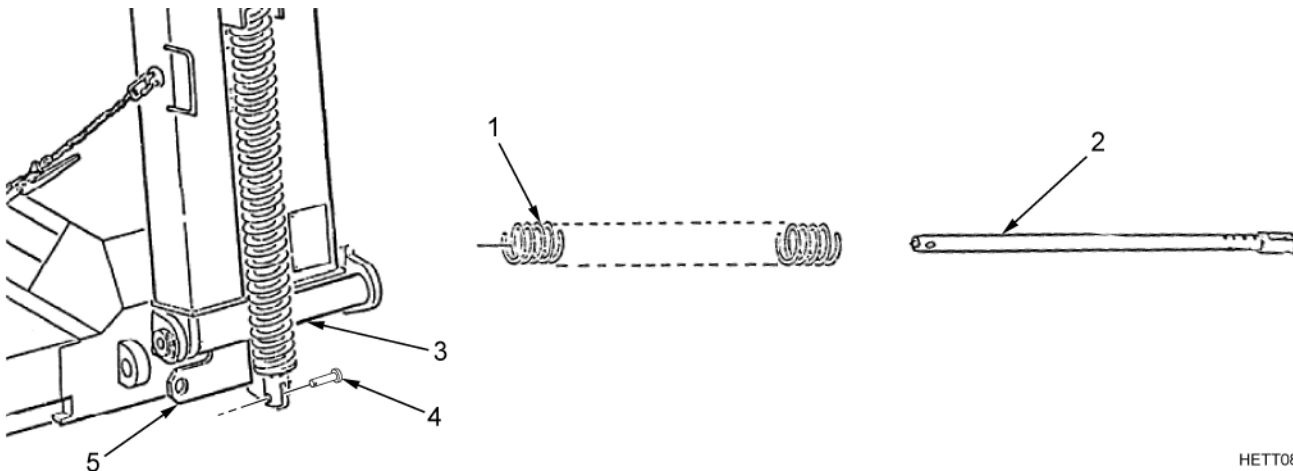
END OF TASK

REPAIR

WARNING

Cleaning compound solvent is used to clean parts and is potentially dangerous to personnel. Extinguish all smoking materials and do not allow sparks or open flame near the work area. Use skin and eye protection and work in a well-ventilated area. Failure to follow this warning may result in injury to personnel.

1. Clean all parts removed in degreaser tank with cleaning compound solvent and wire brush as necessary. Remove any nicks, burrs, or corrosion from polished surfaces using crocus cloth. Replace defective parts as required.
2. Inspect machined surfaces on ramp pivot pin (Figure 9, Item 3), inside diameter of lift lever (Figure 9, Item 5), and shouldered pin (Figure 9, Item 4) for surface deterioration, burrs, scratches, or gouges that could interfere with mounting or mating components and cause rough, sticking, or irregular operation.
3. Inspect spring (Figure 9, Item 1) and guide rod (Figure 9, Item 2) for corrosion, evidence of warping, cracks, excessive dents, gouges, or wear. Check for loose, missing, or damaged attaching hardware. Replace defective components as required.



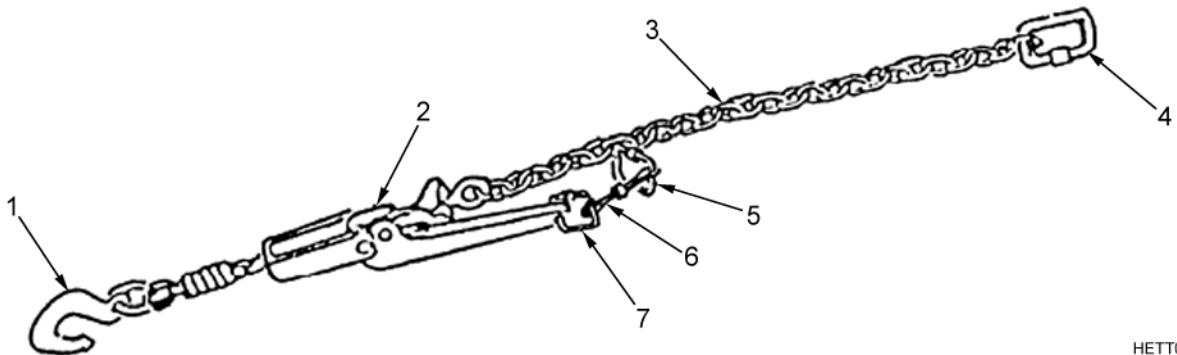
HETT0862

Figure 9. Loading Ramp Repair.

NOTE

If the snap must be replaced and is attached to the load binder handle with a welded link, the welded link must be cut off and replaced with a QuickLink.

4. Inspect chain assembly (Figure 10, Item 3) for proper operation of load binder (Figure 10, Item 2), three QuickLinks (Figure 10, Item 4, Item 5, and Item 7), snap (Figure 10, Item 6), and chain hook (Figure 10, Item 1). Replace QuickLinks, snap, and chain assembly if any components are defective.



HETT0863

Figure 10. Loading Ramp Repair.

END OF TASK

INSTALLATION

1. Install lifting chain (Figure 11, Item 2) through opening at top of ramp weldment (Figure 11, Item 3) and attach lifting chain to a suitable overhead lifting device (Figure 11, Item 1).
2. Use one person to operate lifting device (Figure 11, Item 1) and a second person to steady and guide ramp weldment (Figure 11, Item 3); then raise and position ramp at rear of semitrailer with ramp pivot shaft lug weldments (Figure 11, Item 7) aligned with platform lug weldment (Figure 11, Item 6).

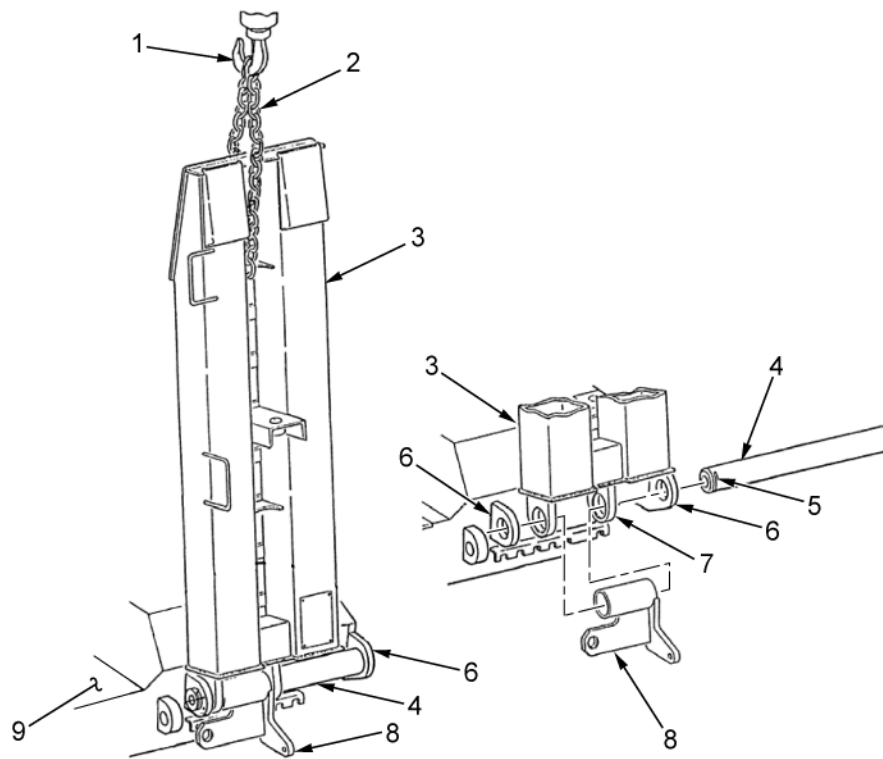
WARNING

The ramp pivot shaft weighs in excess of 140 lb (63.5 kg). Use two people when installing shaft. Failure to follow this warning may result in serious injury to personnel.

NOTE

Prior to installing ramp pivot shaft, be sure keyed end of shaft is pointed toward outboard side of platform.

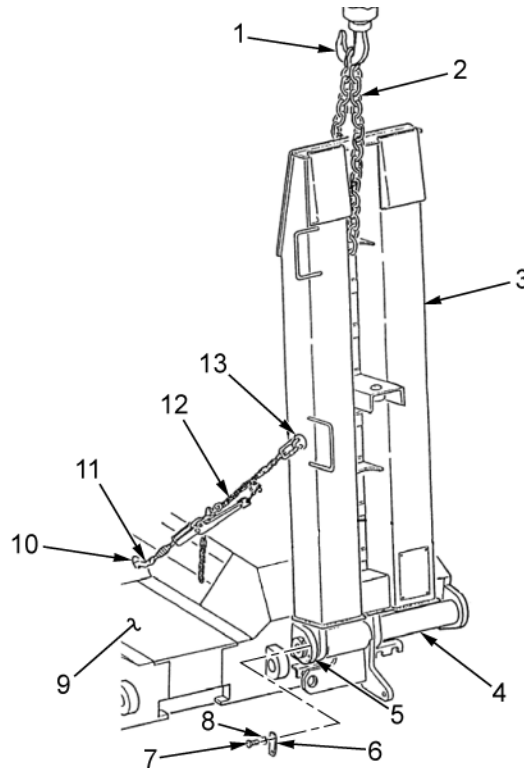
3. Use two people to place leading edge of ramp pivot shaft (Figure 11, Item 4) through opening on outboard platform lug weldment (Figure 11, Item 6). Then start to enter opening on outboard ramp lug weldment (Figure 11, Item 7).
4. Position ramp lift lever (Figure 11, Item 8) between ramp lug weldments (Figure 11, Item 7) and align with pivot shaft (Figure 11, Item 4). Check alignment of pivot shaft, lift lever, and outboard lug weldments (Figure 11, Item 6) on ramp (Figure 11, Item 3) and platform (Figure 11, Item 9). If necessary, operate overhead lifting device (Figure 11, Item 1) as required to obtain proper alignment.
5. With all components aligned, use sledge hammer to continue driving pivot shaft (Figure 11, Item 4) inboard through lift lever (Figure 11, Item 8), through inboard ramp lug weldment (Figure 11, Item 7), and through inboard platform lug weldment (Figure 11, Item 6) until key slot (Figure 11, Item 5) in end of pivot shaft is properly positioned. If necessary, using a pipe wrench, turn pivot shaft so that key slot is properly aligned.



HETT0864

Figure 11. Loading Ramp Installation.

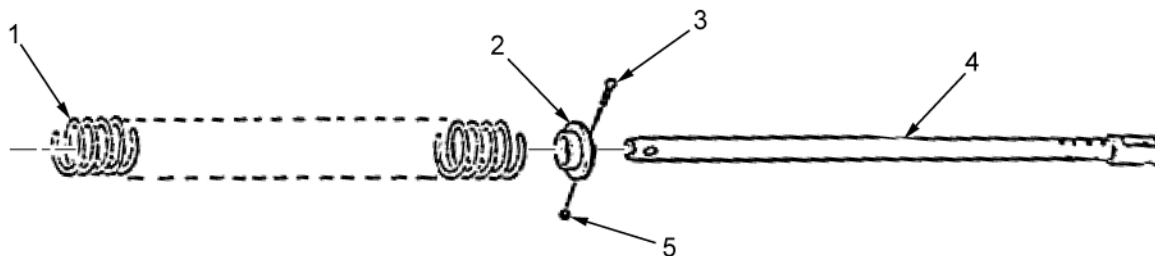
6. Install key plate (Figure 12, Item 6) into key slot (Figure 12, Item 5) of pivot shaft (Figure 12, Item 4) and secure with two lockwashers (Figure 12, Item 8) and capscrews (Figure 12, Item 7).
7. Install QuickLink (Figure 12, Item 13) of chain assembly (Figure 12, Item 12) to inboard side of ramp (Figure 12, Item 3). Move lifting device (Figure 12, Item 1) as required until ramp is in the forward stowed position. Insert chain hook (Figure 12, Item 11) in hole (Figure 12, Item 10) on platform (Figure 12, Item 9).
8. Remove overhead lifting device (Figure 12, Item 1) and lifting chain (Figure 12, Item 2) from ramp (Figure 12, Item 3).



HETT0865

Figure 12. Loading Ramp Installation.

9. Slide adjustment fitting (Figure 13, Item 2) onto spring guide rod (Figure 13, Item 4), but do not install cap screw (Figure 13, Item 3) and nut (Figure 13, Item 5) at this time.
10. Slide helical spring (Figure 13, Item 1) onto spring guide rod (Figure 13, Item 4).



HETT0858

Figure 13. Loading Ramp Installation.

11. Use two people to lift and position spring and guide rod assembly (Figure 14, Item 4) onto ramp (Figure 14, Item 1) with upper end of guide rod (Figure 14, Item 2) inserted through bracket weldment (Figure 14, Item 3) and lower end of guide rod (Figure 14, Item 5) on ramp lever (Figure 14, Item 8).

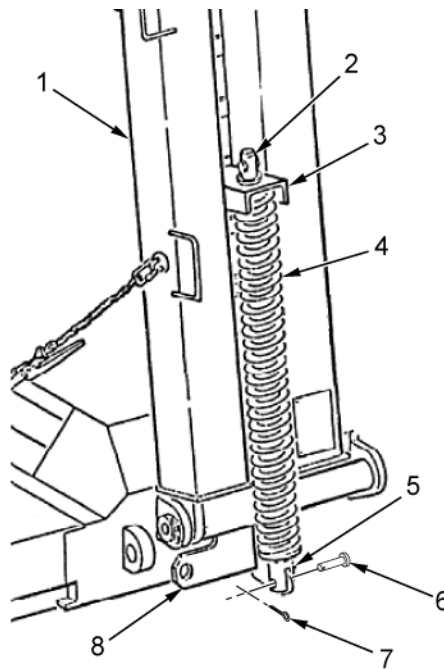
WARNING



- Adhesives, solvents, and sealing compounds may burn easily, may give off harmful vapors, and are harmful to skin and clothing. Keep away from open flames and use in well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.
- On direct contact, uncured silicone sealant irritates eyes. In case of contact, flush eyes with water and seek medical attention. In case of skin contact, wipe off and flush with water.

Failure to follow these warnings may result in injury or death to personnel.

12. Apply grease to shouldered pin (Figure 14, Item 6) and install pin through guide rod (Figure 14, Item 5) and ramp lever (Figure 14, Item 8). Secure with cotter pin (Figure 14, Item 7).



HETT0866

Figure 14. Loading Ramp Installation.

NOTE

Ramp is lowered toward horizontal position to permit installation of the capscrew and washer installed on top end of the spring guide rod.

13. Unhook chain assembly (Figure 15, Item 2) from platform (Figure 15, Item 1) and reconnect hook (Figure 15, Item 3) to hole in ramp lift lever (Figure 15, Item 14). Ensure spring guide rod (Figure 15, Item 11) is aligned in ramp weldment bracket (Figure 15, Item 12) and lower ramp (Figure 15, Item 4) until spring (Figure 15, Item 13) supports weight of ramp (Figure 15, Item 4).
14. Install washer (Figure 15, Item 9) over end of guide rod (Figure 15, Item 11) protruding through top of ramp weldment bracket (Figure 15, Item 12). Install capscrew (Figure 15, Item 8) through hole in guide rod and secure capscrew with locknut (Figure 15, Item 10).
15. Return ramp (Figure 15, Item 4) to raised (stow) position (WP 0009). If chain (Figure 15, Item 5) sags with load binder (Figure 15, Item 7) closed, open load binder, remove QuickLink (Figure 15, Item 6), and shorten chain until there is no sag.

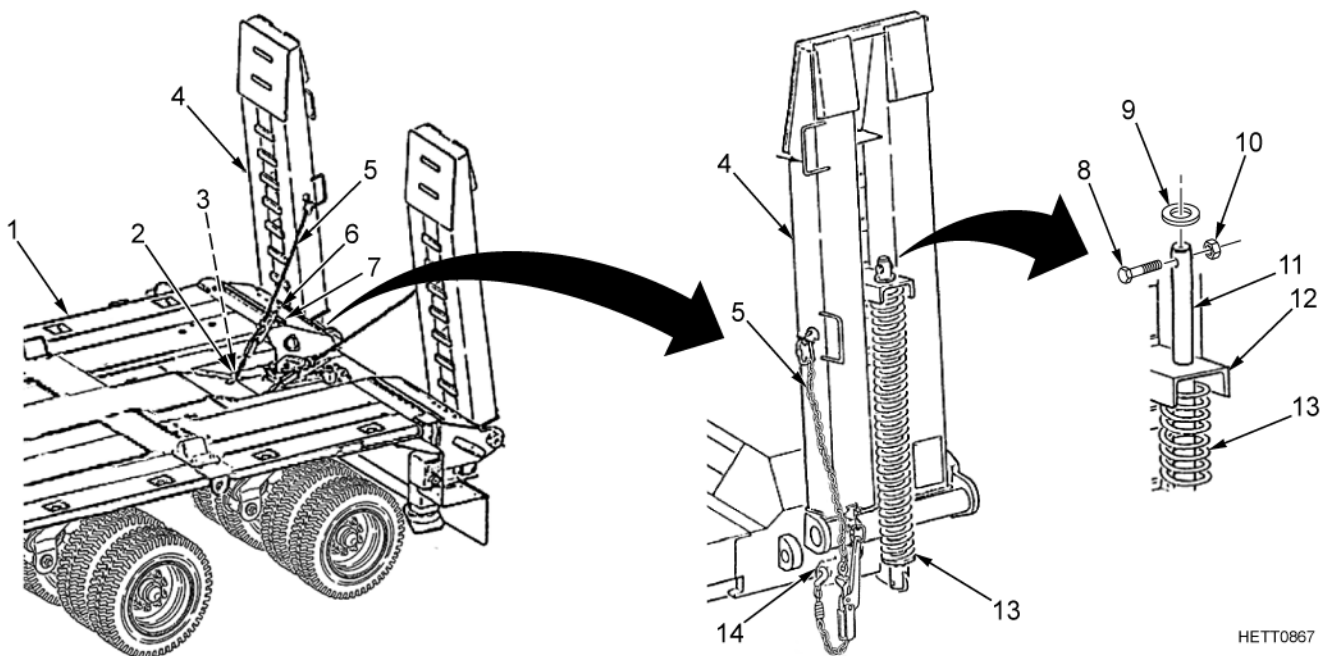
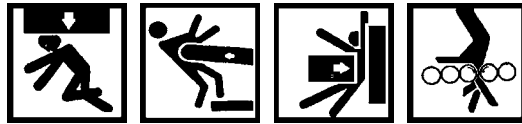


Figure 15. Loading Ramp Installation.

16. Use two people to slide adjustment fitting (Figure 16, Item 9) and spring (Figure 16, Item 6) upward on guide rod (Figure 16, Item 5) until top of spring is positioned even with bottom of tube guide (Figure 16, Item 4) located on underside of weldment bracket (Figure 16, Item 3).

WARNING



Ramps with almost full width traction bars are heavy. If ramp spring is not adjusted properly, they will fall to the ground quickly. Failure to follow this warning may result in serious injury to personnel or damage to equipment.

NOTE

Vertical pattern of seven holes through lower end of guide rod are staggered and spaced 0.5 in. (1.27 cm) apart.

17. If seven traction bars (Figure 16, Item 1) on ramp are just slightly longer than width of gap between two tubes (Figure 16, Item 11 and Item 2), align holes in adjustment fitting (Figure 16, Item 9) with hole in spring guide rod (Figure 16, Item 5), which places top of spring (Figure 16, Item 6) within 0.75 in. (1.9 cm) of underside of weldment bracket (Figure 16, Item 3) without touching. If seven traction bars on ramp reach almost full width of ramps, compress spring and align holes on adjustment fitting with fourth of seven holes in rod. Install capscrew (Figure 16, Item 7) and locknut (Figure 16, Item 8).
18. Lubricate pivot shaft (Figure 16, Item 10) and spring rod (Figure 16, Item 5) (WP 0163).
19. Check spring (Figure 16, Item 6) adjustment.

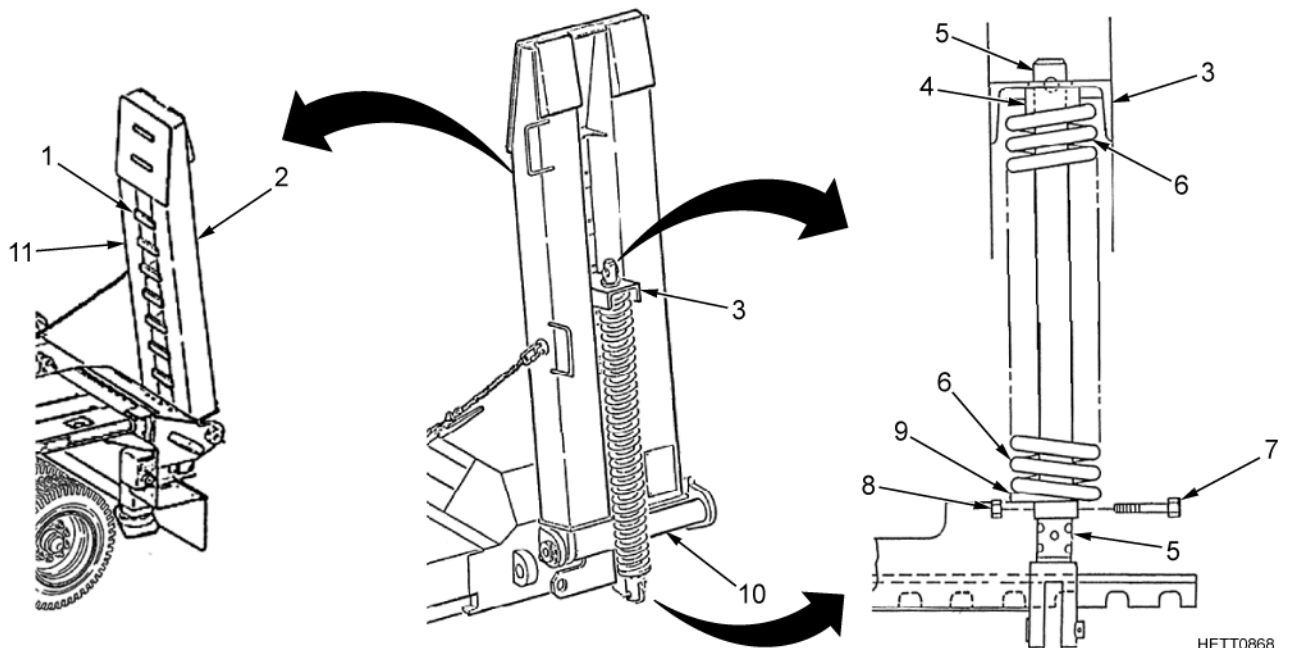
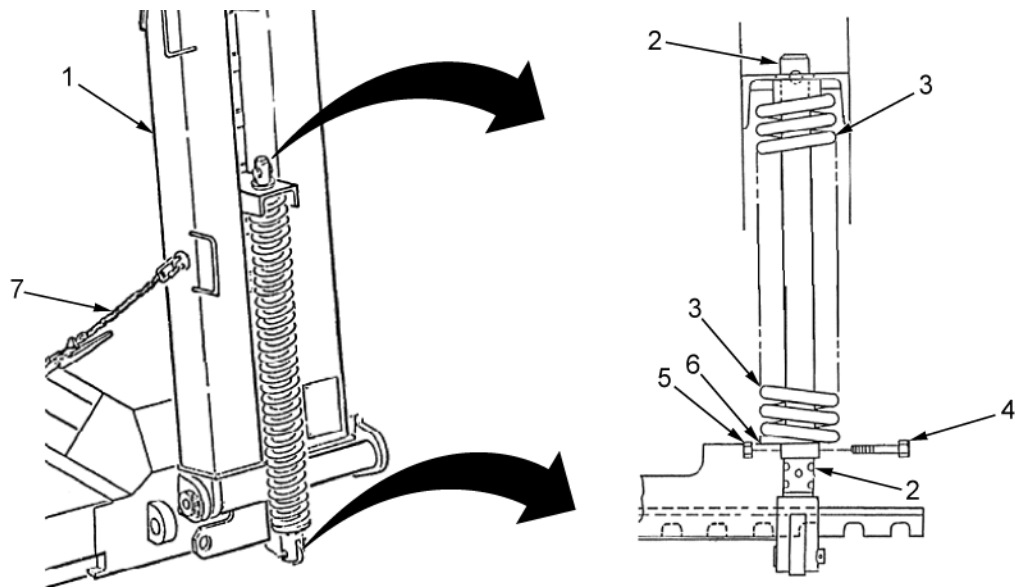


Figure 16. Loading Ramp Spring Installation.

END OF TASK

ADJUSTMENT

1. Adjust rear of platform to 36 in. (91.4 cm) high (WP 0008).
2. Operate spring (Figure 17, Item 3) assisted ramps (Figure 17, Item 1) (WP 0009) and check for proper tension of spring (Figure 17, Item 3) adjustment as follows:
 - a. When lowering ramps (Figure 17, Item 1), the ramp ends, upon first contact with the ground, should remain on the ground or rise not more than 6 in. (15 cm) from bottom of ramp to ground. If ramp ends rise higher, spring tension (Figure 17, Item 3) may be too great. To reduce spring tension, proceed to step 3 below.
 - b. When lowering ramps (Figure 17, Item 1), the ramp ends, without downward push from operator, should not forcefully strike the ground and remain there. Raising of ramp should not require extreme effort by one operator. If above conditions are observed, ramp springs (Figure 17, Item 3) do not have sufficient tension. Refer to step 4 to increase spring tension.
 - c. If ramp (Figure 17, Item 1) meets requirements of steps 2a and 2b, ramps are properly adjusted.
3. Reduce spring (Figure 17, Item 3) tension as follows:
 - a. Raise ramps (Figure 17, Item 1) and attach chain assemblies (Figure 17, Item 7) to platform (WP 0009).
 - b. One person must hold spring (Figure 17, Item 3) in place while second person removes locknut (Figure 17, Item 5) and capscrew (Figure 17, Item 4) from adjustment fitting (Figure 17, Item 6).
 - c. Lower adjustment fitting (Figure 17, Item 6) on spring guide rod (Figure 17, Item 2) and align with next available hole in rod. Insert capscrew (Figure 17, Item 4) and secure with locknut (Figure 17, Item 5).
 - d. Operate ramps (Figure 17, Item 1) and check for proper tension on spring (Figure 17, Item 3). Repeat steps 3a and 3b as required.
4. Increase spring tension as follows:
 - a. Raise ramps and attach chain assemblies (Figure 17, Item 7) to platform (WP 0009).
 - b. One person must hold spring (Figure 17, Item 3) in place while second person removes locknut (Figure 17, Item 5) and capscrew (Figure 17, Item 4) from adjustment fitting (Figure 17, Item 6).
 - c. Slide spring (Figure 17, Item 3) and adjustment fitting (Figure 17, Item 6) upward on spring guide rod (Figure 17, Item 2) and align adjustment fitting with next available hole in rod. Install capscrew (Figure 17, Item 4) and secure capscrew with locknut (Figure 17, Item 5).
 - d. Operate ramps (Figure 17, Item 1) and check for proper tension on spring (Figure 17, Item 3). Repeat steps 4a and 4b as required.



HETT0869

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**AUXILIARY POWER UNIT (APU) FRAME**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)

Equipment Conditions

Auxiliary Power Unit (APU) removed (WP 0128)

APU hydraulic lines and fittings removed (WP 0117)

Hydraulic tank assembly removed (WP 0126)

Materials/Parts

Locknuts (2)

Locknuts (2)

Personnel Required

2

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the Auxiliary Power Unit (APU) frame.

REMOVAL

WARNING

- When on top of the gooseneck and removing or installing guardrails, always hold onto semitrailer with one hand or injury to personnel may result.
- On some semitrailers a solar battery charger is mounted to the top of the gooseneck directly in front of spare tires. Persons working on top of the gooseneck must take **EXTREME** care not to step on the gooseneck or trip over it. Failure to follow this warning may result in injury to personnel or damage to equipment.

1. Remove two bolts (Figure 1, Item 6), two retaining plates (Figure 1, Item 13), and sections of two block clamps (Figure 1, Item 12) from APU frame (Figure 1, Item 1).
2. Remove two locknuts (Figure 1, Item 5), capscrews (Figure 1, Item 2), and four washers (Figure 1, Item 3) from APU frame (Figure 1, Item 1) and weldment brackets (Figure 1, Item 4) on streetside of gooseneck; curbside not shown.
3. Remove two locknuts (Figure 1, Item 7), capscrews (Figure 1, Item 11), washers (Figure 1, Item 10), and lower portion of resilient mount (Figure 1, Item 8) from APU frame (Figure 1, Item 1) and weldment brackets (Figure 1, Item 9) on curbside of gooseneck; streetside not shown.

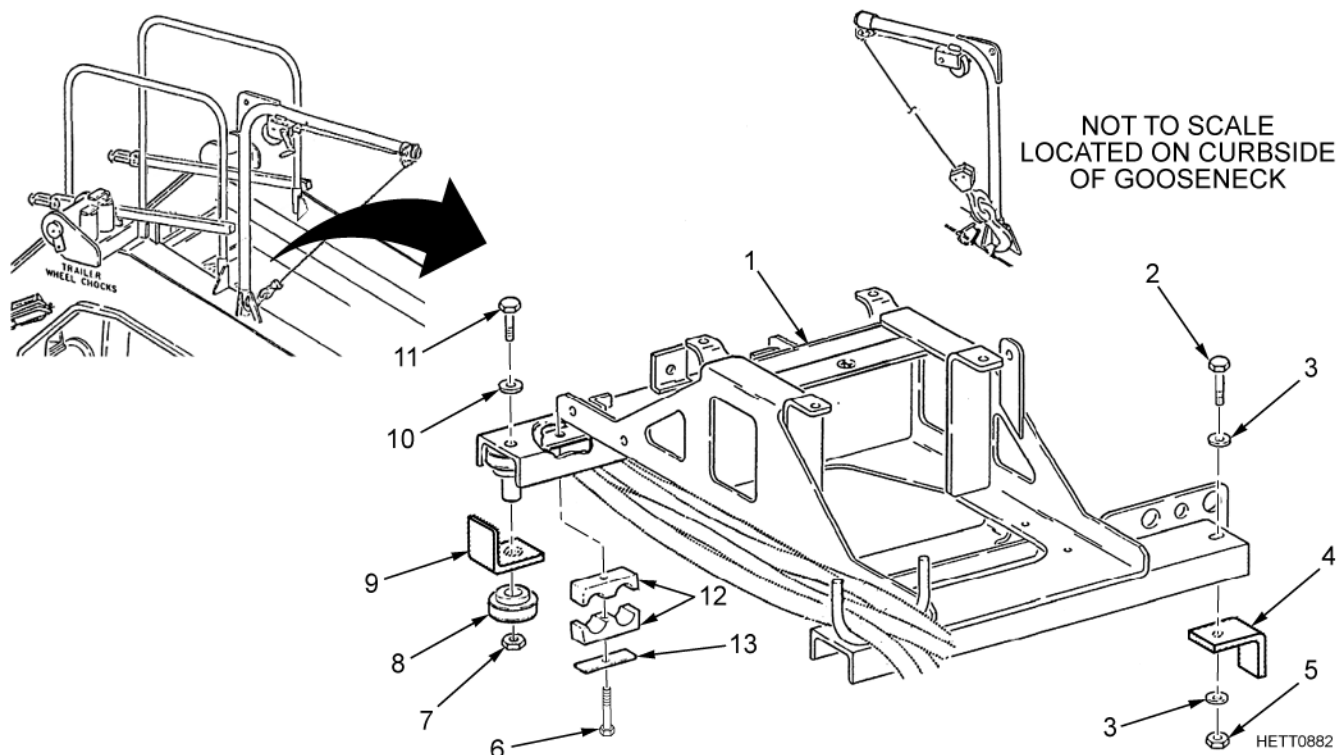


Figure 1. APU Frame Removal.

4. Unhook davit cable (Figure 2, Item 5) and hook (Figure 2, Item 4) from davit base (Figure 2, Item 8) on gooseneck (Figure 2, Item 1).
5. Unfasten lynch pin (Figure 2, Item 9) and remove hitch pin (Figure 2, Item 10) from davit base (Figure 2, Item 8). Swing davit arm (Figure 2, Item 7) toward streetside of gooseneck and continue turning until davit winch cable (Figure 2, Item 5) and hook (Figure 2, Item 4) is above APU frame (Figure 2, Item 2).
6. Operate davit winch (Figure 2, Item 6) to lower davit winch cable (Figure 2, Item 5) and hook (Figure 2, Item 4) to APU frame (Figure 2, Item 2).
7. Attach davit winch cable (Figure 2, Item 5) and hook (Figure 2, Item 4) to hole (Figure 2, Item 3) at center of APU frame (Figure 2, Item 2).
8. Operate davit winch (Figure 2, Item 6) and raise APU frame (Figure 2, Item 2) approximately 6 in. (15 cm) and remove upper resilient mount (Figure 2, Item 12) and sleeve bushing (Figure 2, Item 11) from curbside of APU frame (Figure 2, Item 2); streetside not shown.

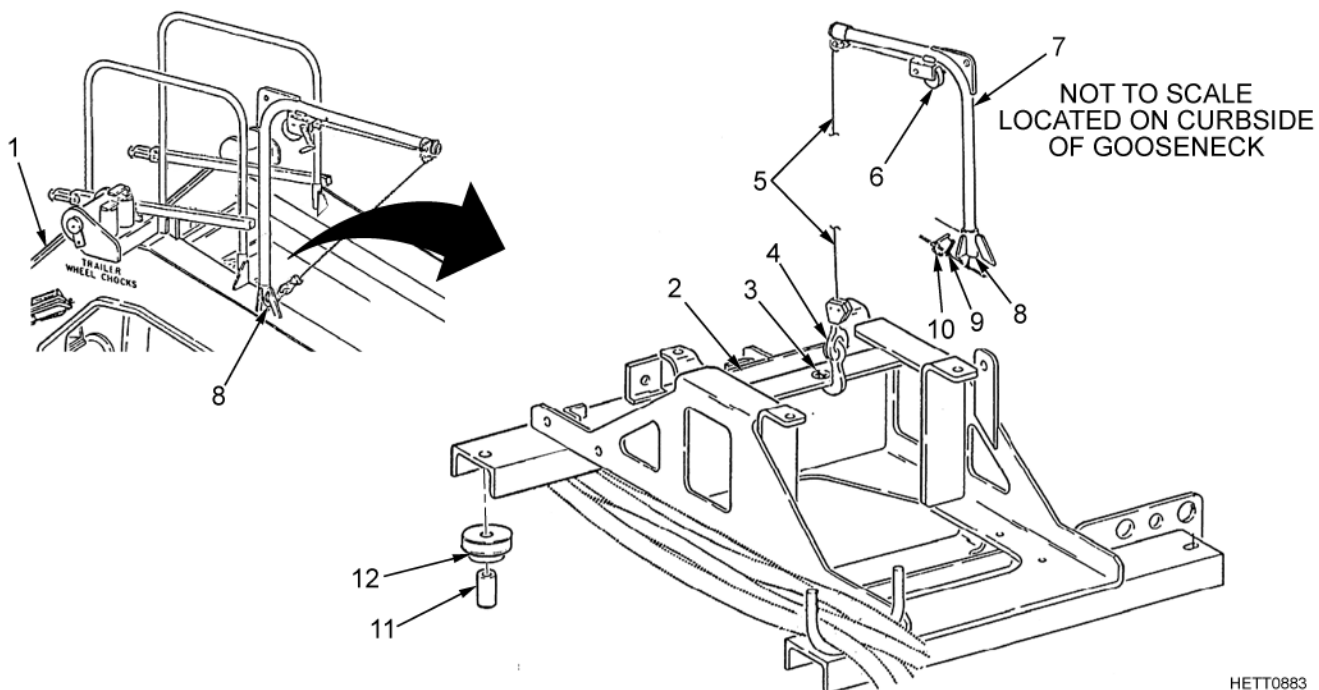
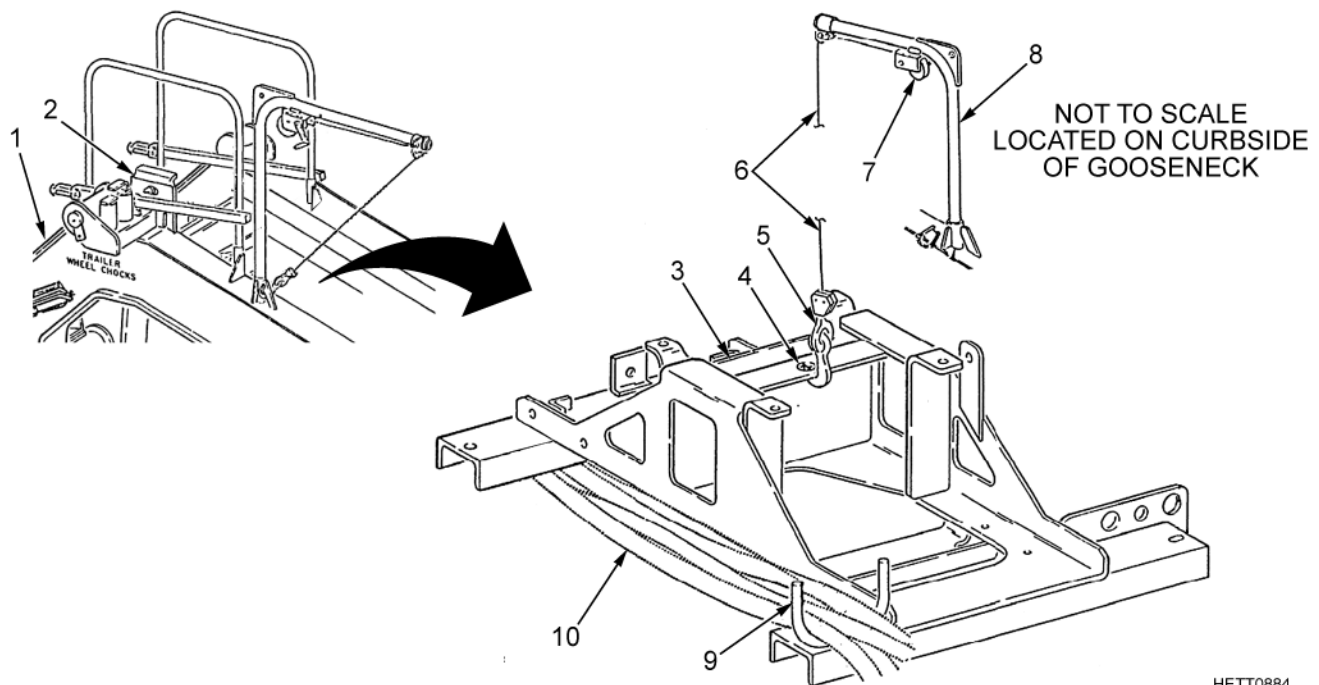


Figure 2. APU Frame Removal.

NOTE

The gooseneck steering hydraulic hoses must be removed from the U-shaped bracket on the APU frame and then repositioned under the APU frame. The APU frame will need to be lifted slightly so that hoses can be moved.

9. Carefully remove hydraulic hoses (Figure 3, Item 10), one at a time, from U-shaped bracket (Figure 3, Item 9) and reposition under APU frame (Figure 3, Item 3).
10. Use one person to steady and guide APU frame (Figure 3, Item 3) and a second person to operate davit winch (Figure 3, Item 7) on davit arm (Figure 3, Item 8); then raise APU frame until it can clear gooseneck (Figure 3, Item 1) step support weldments (Figure 3, Item 2).
11. Carefully swing davit arm (Figure 3, Item 8) until APU frame (Figure 3, Item 3) is suspended over curbside of gooseneck (Figure 3, Item 1).
12. With one person stationed on the ground near gooseneck (Figure 3, Item 1), second person must operate davit winch (Figure 3, Item 7) on davit arm (Figure 3, Item 8) to lower APU frame (Figure 3, Item 3) to ground.
13. Remove hook (Figure 3, Item 5) and davit winch cable (Figure 3, Item 6) from hole (Figure 3, Item 4) in the APU frame (Figure 3, Item 3).



HETT0884

Figure 3. APU Frame Removal.

END OF TASK

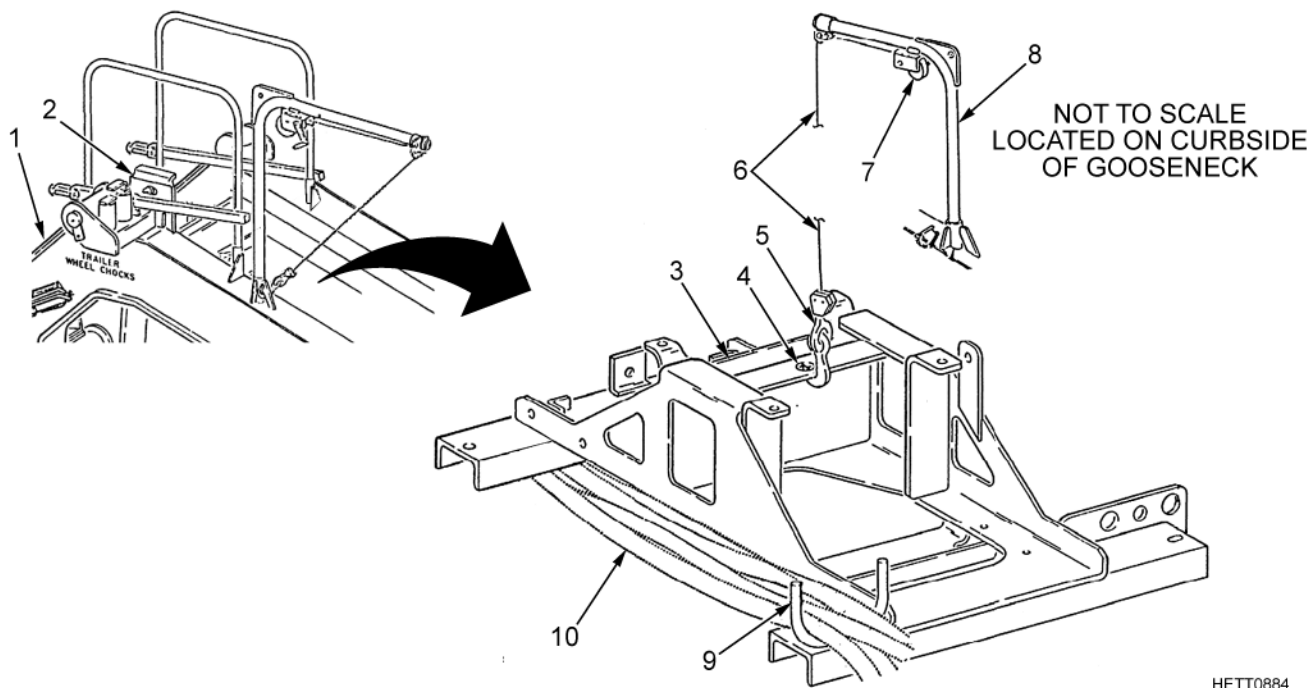
INSTALLATION

1. Place APU frame (Figure 4, Item 3) on ground near curbside of gooseneck (Figure 4, Item 1).
2. Attach davit winch cable (Figure 4, Item 6) and hook (Figure 4, Item 5) to hole (Figure 4, Item 4) to center of APU frame (Figure 4, Item 3).
3. Use one person on the ground to steady and guide APU frame (Figure 4, Item 3) and a second person to operate davit winch (Figure 4, Item 7) on davit arm (Figure 4, Item 8) to raise APU frame up above gooseneck (Figure 4, Item 1) step support weldments mounting brackets (Figure 4, Item 2).
4. With two people on gooseneck (Figure 4, Item 1), one person must steady and guide APU frame (Figure 4, Item 3) while second person swings davit arm (Figure 4, Item 8) with APU frame toward rear of gooseneck until frame is positioned approximately above step support weldment mounting brackets (Figure 4, Item 2) in gooseneck.
5. Operate davit winch (Figure 4, Item 7) on davit arm (Figure 4, Item 8) and lower APU frame (Figure 4, Item 3) to approximately 6 in. (15 cm) above gooseneck (Figure 4, Item 1) step support weldment mounting brackets (Figure 4, Item 2).

NOTE

The gooseneck steering hydraulic hoses must be repositioned under forward end of APU frame and placed in the U-shaped bracket on top of aft end of APU frame. The APU frame may need to be tilted slightly to permit repositioning of the hoses.

6. Carefully move hydraulic hoses (Figure 4, Item 10), one at a time, from beneath aft end of APU frame (Figure 4, Item 3) and place each hose in U-shaped retaining bracket (Figure 4, Item 9) on top of APU frame.



HETT0884

Figure 4. APU Frame Installation.

7. From underside of gooseneck (Figure 5, Item 1), position two upper portions of resilient mounts (Figure 5, Item 13) on streetside mounting brackets, not shown, on gooseneck.
8. One person must operate davit winch (Figure 5, Item 3) on davit arm (Figure 5, Item 4) to lower APU frame (Figure 5, Item 2) while second person steadies and guides APU frame into position on resilient mounts (Figure 5, Item 13) and curbside mounting brackets (Figure 5, Item 11).
9. Install two capscrews (Figure 5, Item 15) and washers (Figure 5, Item 14) through top of APU frame (Figure 5, Item 2), upper resilient mount (Figure 5, Item 13).
10. From underside of gooseneck (Figure 5, Item 1), install two sleeve bushings (Figure 5, Item 12) and lower resilient mounts (Figure 5, Item 10) on sleeve bushings protruding through mounting brackets (Figure 5, Item 11). Install locknuts (Figure 5, Item 9) on capscrews (Figure 5, Item 15), but do not tighten.
11. Install two capscrews (Figure 5, Item 5), four washers (Figure 5, Item 6), and two locknuts (Figure 5, Item 8) securing APU frame (Figure 5, Item 2) to weldment brackets (Figure 5, Item 7) on curbside of gooseneck (Figure 5, item 1); streetside not shown. Tighten locknuts (Figure 5, Item 9) onto capscrews (Figure 5, Item 15).

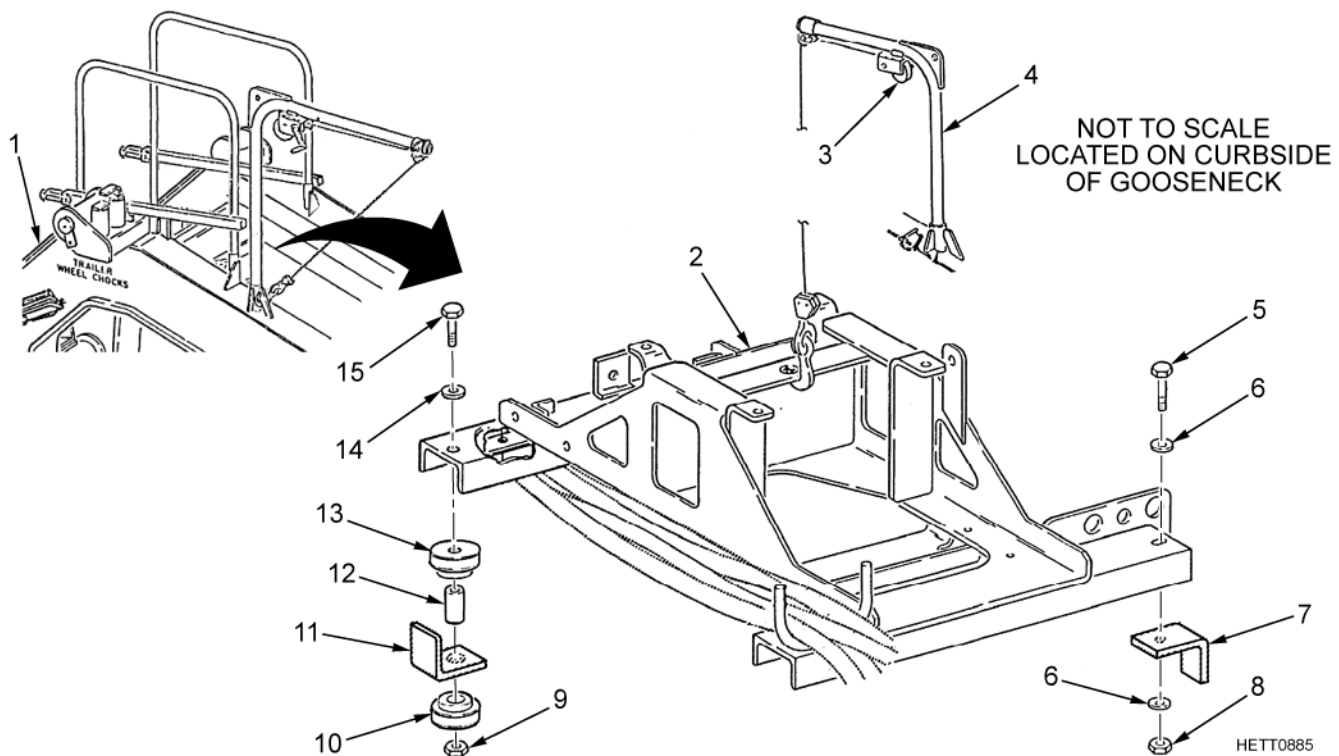
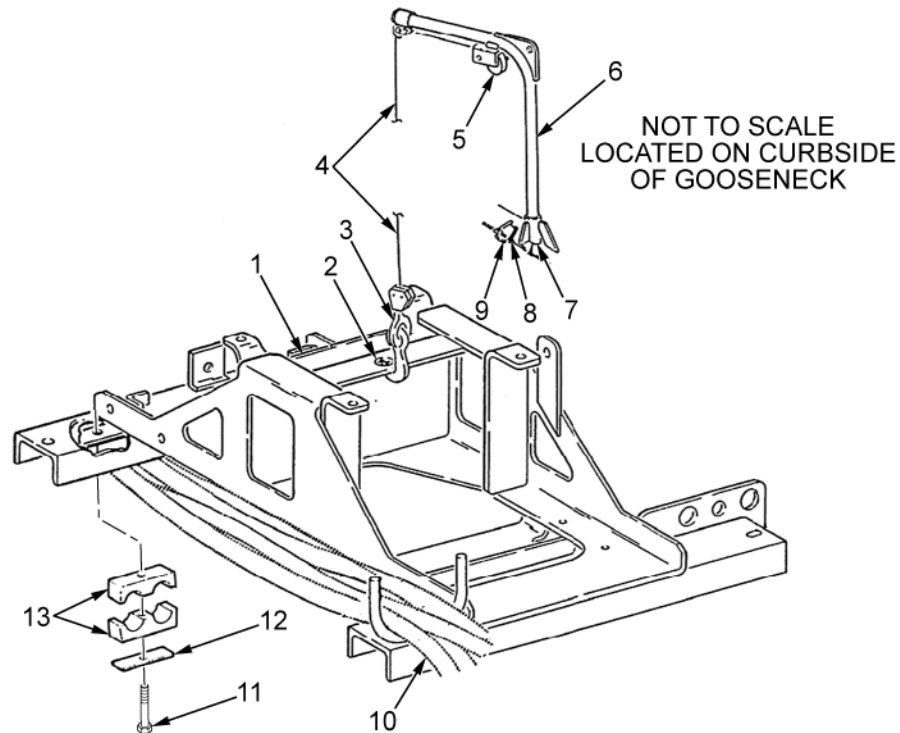


Figure 5. APU Frame Installation.

12. Remove davit winch cable (Figure 6, Item 4) and hook (Figure 6, Item 3) from hole (Figure 6, Item 2) in APU frame (Figure 6, Item 1). Retract winch cable, and swing davit arm (Figure 6, Item 6) back to stow position. Install hitch pin (Figure 6, Item 9) in davit base (Figure 6, Item 7) and secure with linch pin (Figure 6, Item 8). Attach davit winch cable and hook to davit base.
13. Position hydraulic hoses (Figure 6, Item 10) under forward end of APU frame (Figure 6, Item 1) near block clamp (Figure 6, Item 13) mounting position. Install two block clamps and retainer plates (Figure 6, Item 12) onto hydraulic hoses and secure to APU frame (Figure 6, Item 1) with two bolts (Figure 6, Item 11).



HETT0886

Figure 6. APU Frame Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Start and run APU (WP 0005) and check that resilient mounts are properly seated.

END OF WORK PACKAGE

FIELD MAINTENANCE**PIVOT PIN**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Locknut (1)

Personnel Required

2

Materials/Parts

Crocus Cloth (WP 0170, Item 6)
Grease (WP 0170, Item 16)
Solvent, Cleaning Compound (WP 0170, Item 31)

Equipment Conditions

Gooseneck lowered to lowest position, if uncoupled
(WP 0007)

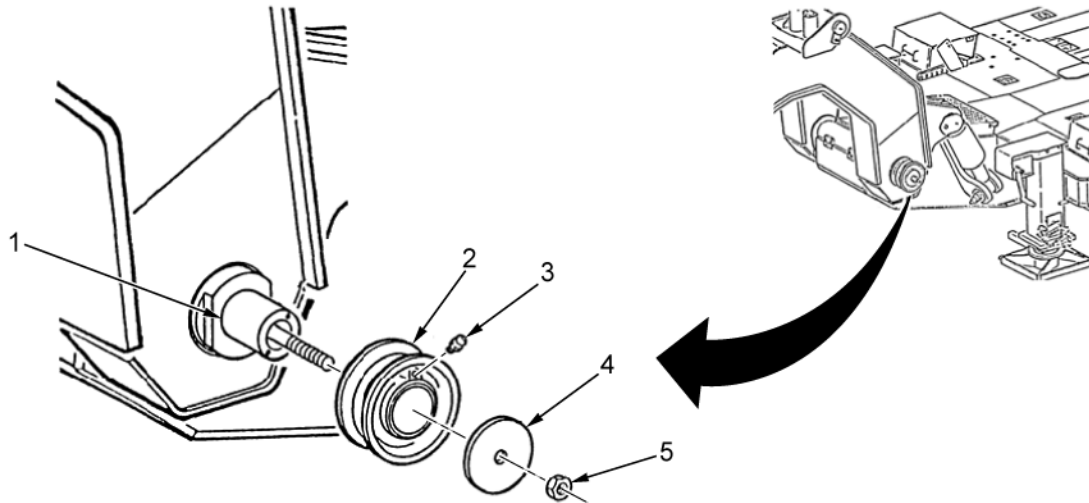
GENERAL INFORMATION

This work package contains instructions for the removal, inspection, and installation of the pivot pin assembly.

REMOVAL**NOTE**

A second person must be used to hold the locknut on curbside of gooseneck while removing the streetside locknut, cover, and pulley to prevent the threaded rod from turning in the pivot pin assembly.

1. Remove locknut (Figure 1, Item 5), cover (Figure 1, Item 4), and pulley (Figure 1, Item 2) from pivot pin assembly (Figure 1, Item 1). Discard locknut.
2. Remove lubrication fitting (Figure 1, Item 3) from pulley (Figure 1, Item 2).



HETT0442

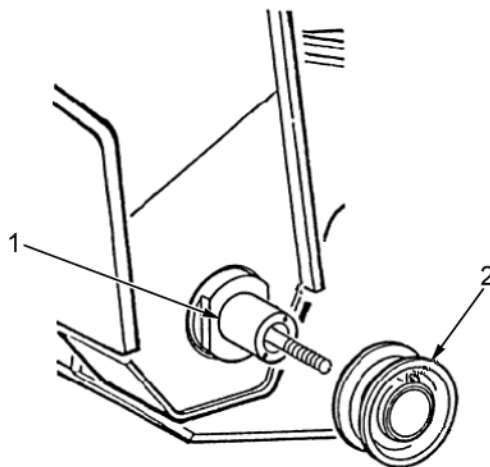
Figure 1. Pivot Pin Removal.

END OF TASK

REPAIR**WARNING**

Cleaning compound solvent is used to clean parts and is potentially dangerous to personnel. Extinguish all smoking materials and do not allow sparks or open flame near the work area. Use skin and eye protection and work in a well-ventilated area. Failure to follow this warning may result in serious injury to personnel.

1. Clean all parts removed in degreaser tank with cleaning compound solvent and wire brush as necessary.
2. Inspect pulley (Figure 2 item 2) for corrosion, evidence of cracks, excessive dents, gouges, warping, and peeling of painted surfaces. Remove any nicks, burrs, or corrosion from inner diameter of pulley (Figure 2 item 2) with crocus cloth. Check for loose, missing, or damaged attaching hardware. Replace defective or missing components as required.
3. Inspect machined surface of pivot pin assembly (Figure 2 item 1) for surface deterioration, burrs, scratches, or gouges that could interfere with mating inner diameter of pulley (Figure 2 item 2) and cause sticking or irregular operation. If pivot pin assembly (Figure 2 item 1) has any of the above issues, notify field maintenance.



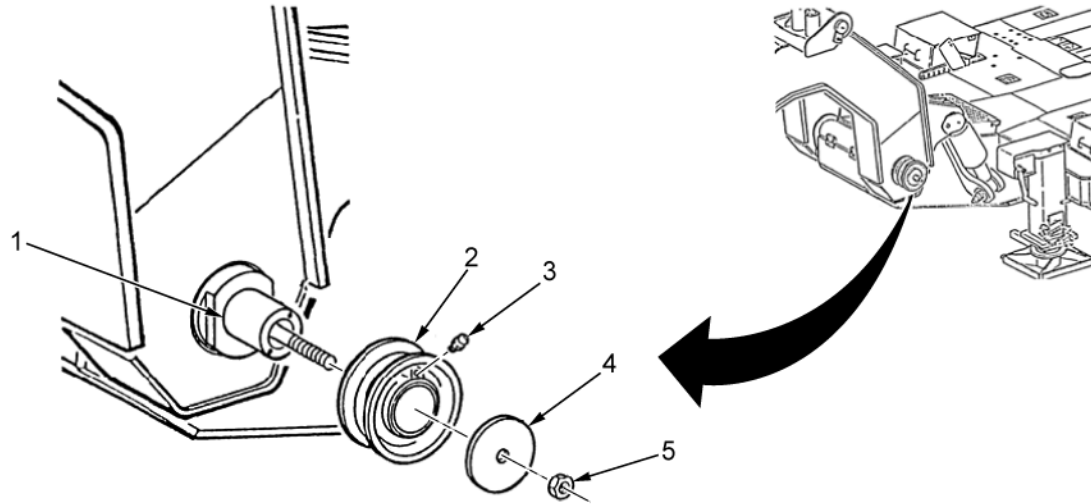
HETT0880

Figure 2. Pivot Pin Inspection.

END OF TASK

INSTALLATION

1. Install lubrication fitting (Figure 3, Item 3) into pulley (Figure 3, Item 2) and apply grease to inner diameter of pulley.
2. Apply grease to surface of pivot pin assembly (Figure 3, Item 1) and install pulley (Figure 3, Item 2) on shaft.
3. Install cover (Figure 3, Item 4) and locknut (Figure 3, Item 5) on pivot pin assembly (Figure 3, Item 1).
4. Wipe off excess grease with rag.



HETT0442

Figure 3. Pivot Pin Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Lubricate pivot pin grooved pulley (WP 0163).

END OF WORK PACKAGE

FIELD MAINTENANCE**SPARE WHEEL CARRIER**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Cotter Pin (4)

Washer (8) (and as required)

Materials/Parts

Brush Scrub (WP 0170, Item 3)
Detergent, General Purpose (WP 0170, Item 11)
Rag, Wiping (WP 0170, Item 23)
Solvent, Cleaning Compound (WP 0170, Item 31)

Personnel Required

2

Equipment Conditions

Spare tires removed (WP 0077)
Steering hydraulic cylinders removed (WP 0086)

GENERAL INFORMATION

This work package contains instructions for the removal, inspection, and installation of the spare wheel carrier.

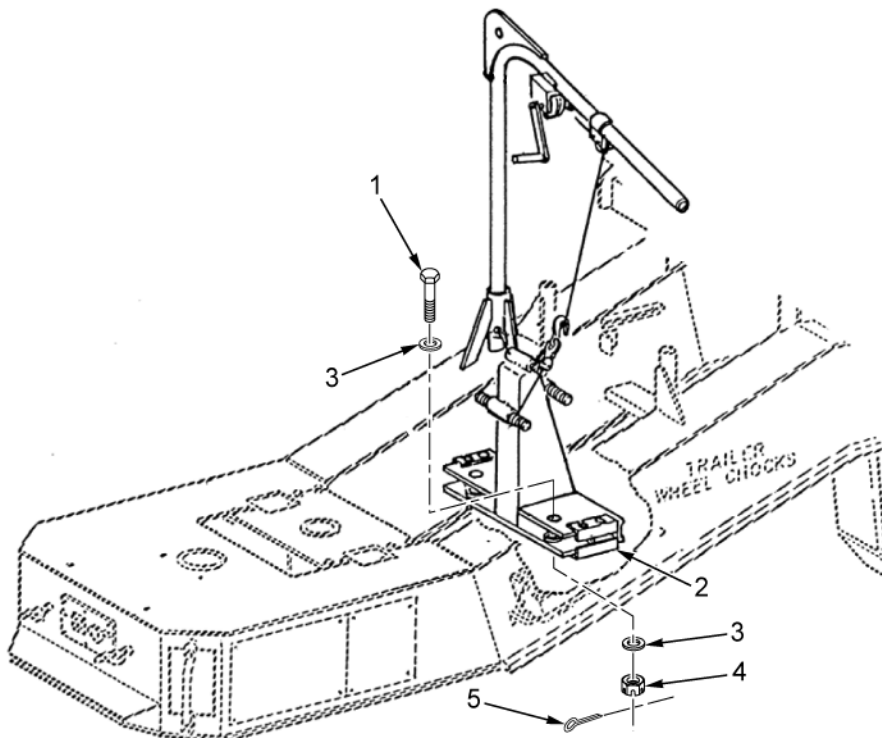
REMOVAL

WARNING

- When on top of gooseneck, always hold the guard rail with one hand to avoid falling and causing injury to personnel.
- On some semitrailers a solar battery charger is mounted to the top of the gooseneck directly in front of spare tires. Persons working on top of the gooseneck must take **EXTREME** care not to step on the gooseneck or trip over it.

Failure to follow this warning may result in injury to personnel or damage to equipment.

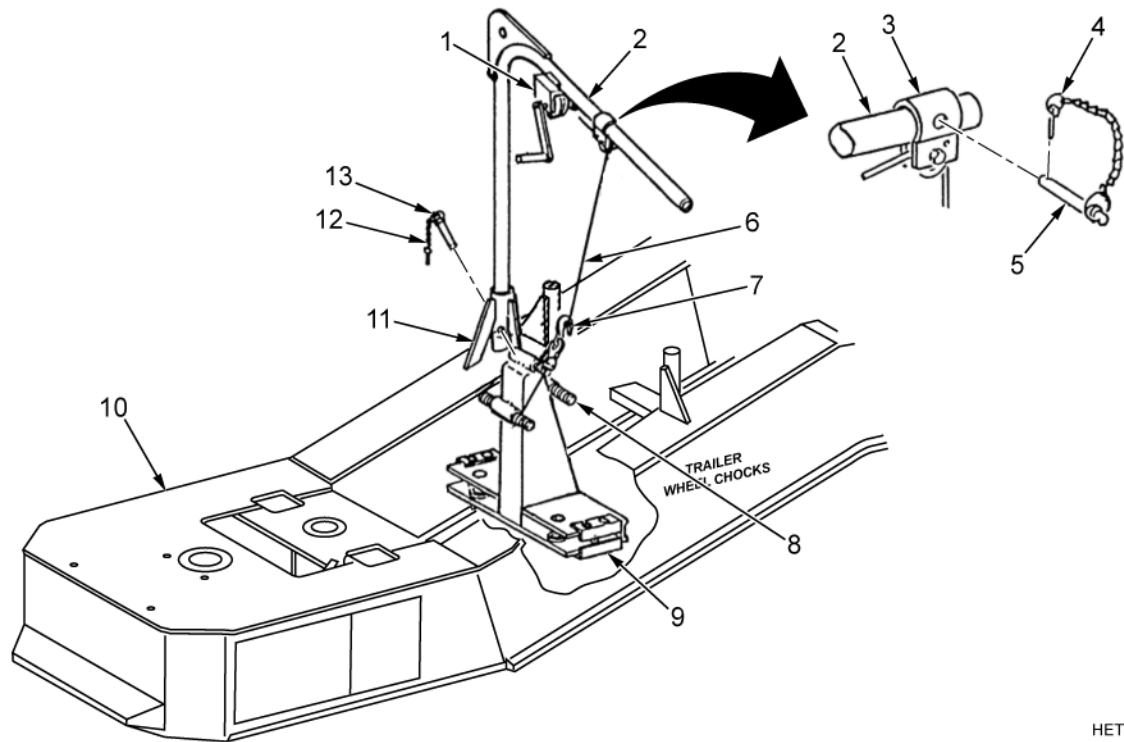
1. Remove four cotter pins (Figure 1, Item 5), slotted nuts (Figure 1, Item 4), eight washers (Figure 1, Item 3), and four capscrews (Figure 1, Item 1) from spare wheel carrier (Figure 1, Item 2). Discard cotter pins.



HETT0443

Figure 1. Spare Wheel Carrier Removal.

2. Unhook davit winch cable (Figure 2, Item 6) from stow point on davit base (Figure 2, Item 11).
3. Release linch pin (Figure 2, Item 4) and remove hitch pin (Figure 2, Item 5) from pulley clamp (Figure 2, Item 3). Reposition pulley clamp on davit arm (Figure 2, Item 2) near davit winch (Figure 2, Item 1). Insert hitch pin and secure with linch pin.
4. Release linch pin (Figure 2, Item 12) and remove hitch pin (Figure 2, Item 13) at davit base (Figure 2, Item 11). Swing davit arm (Figure 2, Item 2) and winch (Figure 2, Item 1) streetside over spare wheel carrier (Figure 2, Item 9).
5. Attach winch cable (Figure 2, Item 6) to spare wheel carrier (Figure 2, Item 9) by wrapping winch cable under wheel supports (Figure 2, Item 8) and attaching hook (Figure 2, Item 7) over winch cable to form a loop.
6. Operate davit winch (Figure 2, Item 1) to lift spare wheel carrier (Figure 2, Item 9) out of gooseneck (Figure 2, Item 10). Swing davit arm (Figure 2, Item 2) and spare wheel carrier out over curbside of gooseneck. Operate davit winch to lower spare wheel carrier to ground. Once on ground, remove winch cable (Figure 2, Item 6) from spare wheel carrier.



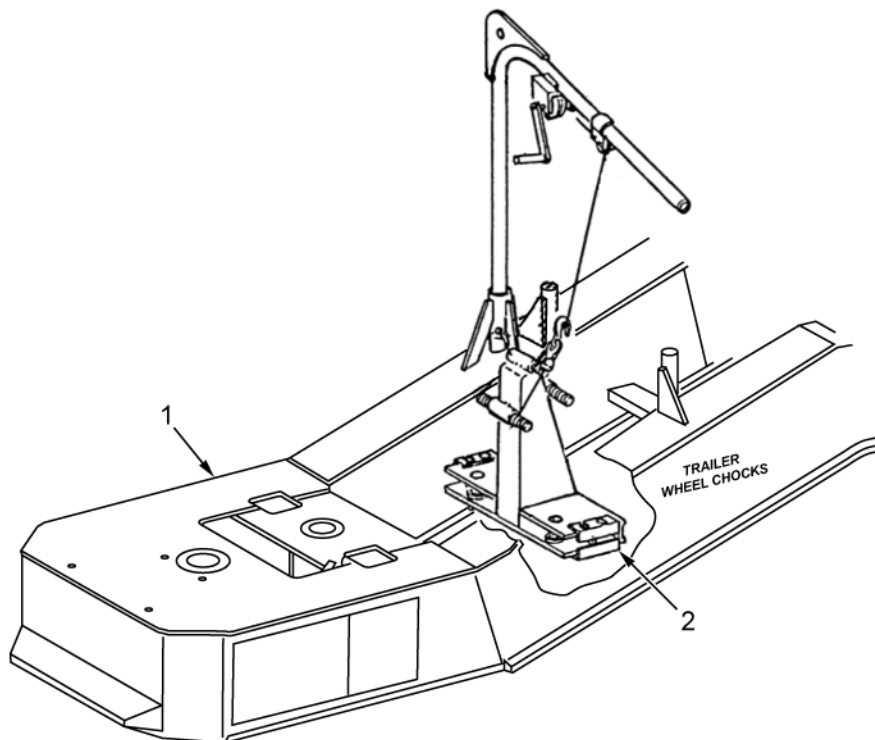
HETT0870

Figure 2. Spare Wheel Carrier Removal.

WARNING

Cleaning compound solvent is used to clean parts and is potentially dangerous to personnel. Extinguish all smoking materials and do not allow sparks or open flame near the work area. Use skin and eye protection and work in a well-ventilated area.

7. Clean spare wheel carrier (Figure 3, Item 2) using general purpose detergent and scrub brush. Use cleaning solvent, wire brush, and crocus cloth for degreasing and removal of corrosion.
8. Inspect spare wheel carrier (Figure 3, Item 2) and carrier mounts on gooseneck (Figure 3, Item 1) for broken welds, warped or bent metal, and defective studs. Inspect for defective or missing mounting hardware. Replace parts as required.



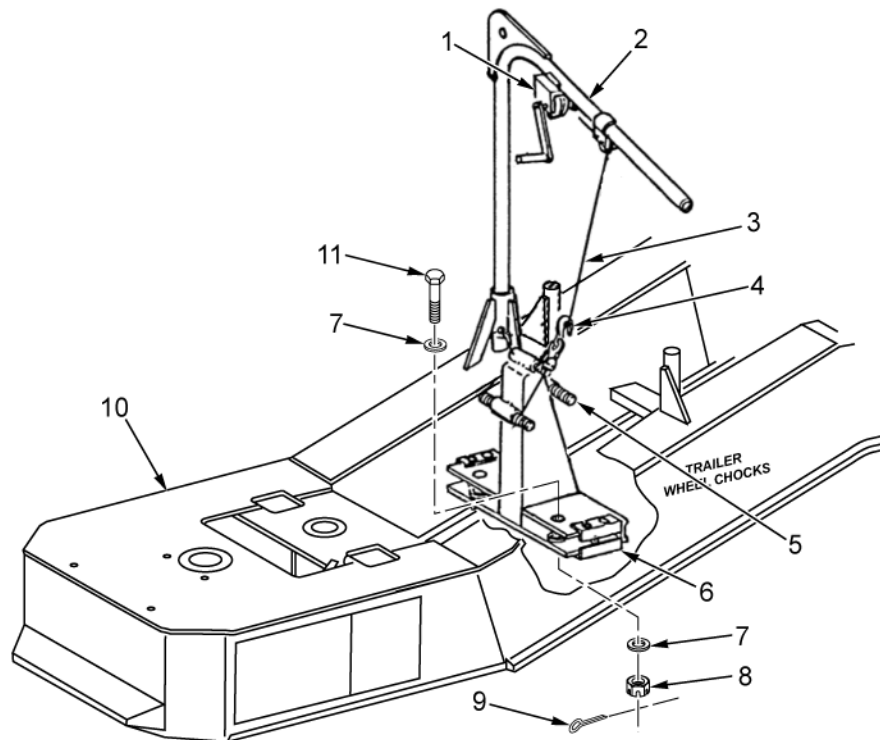
HETT0871

Figure 3. Cleaning and Inspection of Spare Wheel Carrier.

END OF TASK

INSTALLATION

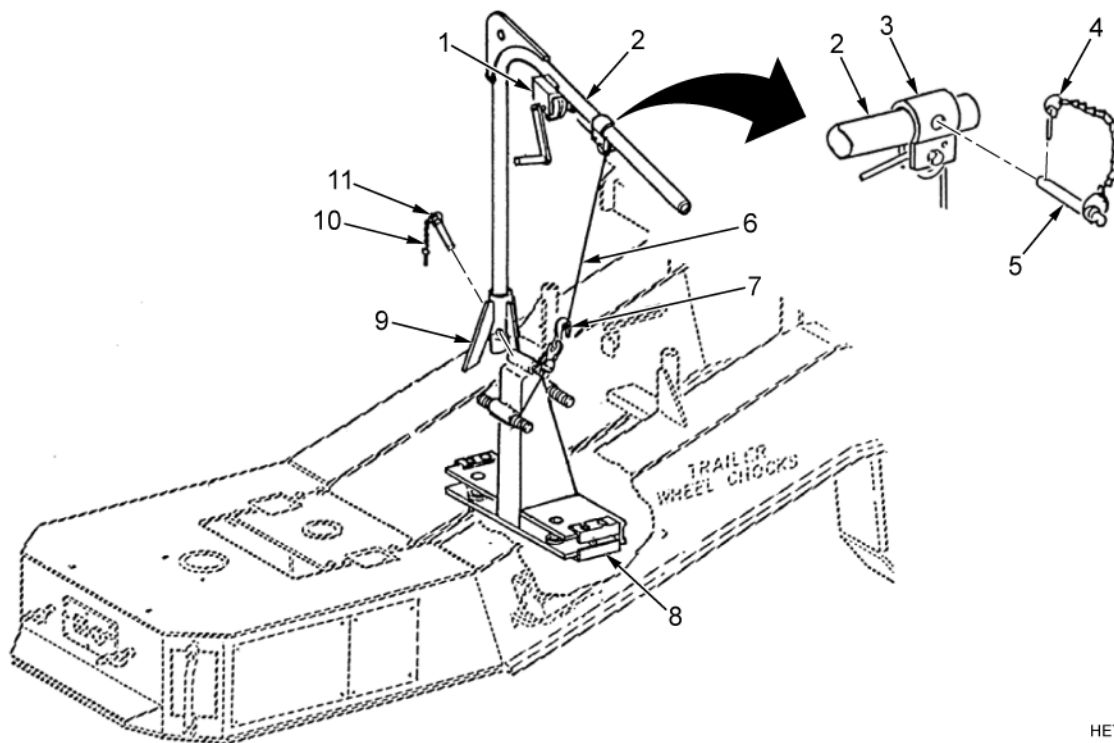
1. Attach winch cable (Figure 4, Item 3) to spare wheel carrier (Figure 4, Item 6) by wrapping winch cable under wheel supports (Figure 4, Item 5) and attaching hook (Figure 4, Item 4) over winch cable to form loop.
2. Operate davit winch (Figure 4, Item 1) to lift spare wheel carrier (Figure 4, Item 6) to clear gooseneck (Figure 4, Item 10).
3. Swing davit arm (Figure 4, Item 2) and winch cable (Figure 4, Item 3) with spare wheel carrier (Figure 4, Item 6) into position on gooseneck (Figure 4, Item 10).
4. Install four bolts (Figure 4, Item 11), eight new washers (Figure 4, Item 7), and four slotted nuts (Figure 4, Item 8). Torque slotted nuts to 420 lb-ft (570 Nm), and then tighten slotted nuts further to align cotter pin hole with next available slot in slotted nut. If necessary, install additional washers under slotted nuts to properly align slotted nuts and cotter pin holes for full engagement of new cotter pins (Figure 4, Item 9) when slotted nuts are properly torqued. Install four cotter pins to secure nuts.



HETT0872

Figure 4. Spare Wheel Carrier Installation.

5. Remove winch cable (Figure 5, Item 6) and hook (Figure 5, Item 7) from spare wheel carrier (Figure 5, Item 8).
6. Return pulley clamp (Figure 5, Item 3) back to stow position at end of davit arm (Figure 5, Item 2). Install hitch pin (Figure 5, Item 5) and secure with linch pin (Figure 5, Item 4).
7. Return davit arm (Figure 5, Item 2) to stow position. Install hitch pin (Figure 5, Item 11) through davit base (Figure 5, Item 9) and secure with linch pin (Figure 5, Item 10).
8. Attach winch cable (Figure 5, Item 6) and hook (Figure 5, Item 7) on davit base (Figure 5, Item 9) and take up slack in cable with davit winch (Figure 5, Item 1).



HETT0873

Figure 5. Spare Wheel Carrier Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Install steering hydraulic cylinders (WP 0086).

Install spare tires (WP 0077).

END OF WORK PACKAGE

FIELD MAINTENANCE**FRONT SUPPORT LEGS**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Cotter Pin (1)

Locknut (4)

Personnel Required

2

Materials/Parts

Crocus Cloth (WP 0170, Item 6)
Rag, Wiping (WP 0170, Item 23)
Solvent, Cleaning Compound (WP 0170, Item 31)
Cotter Pin (1)
Lockwasher (4)
Cotter Pin (1)

Equipment Conditions

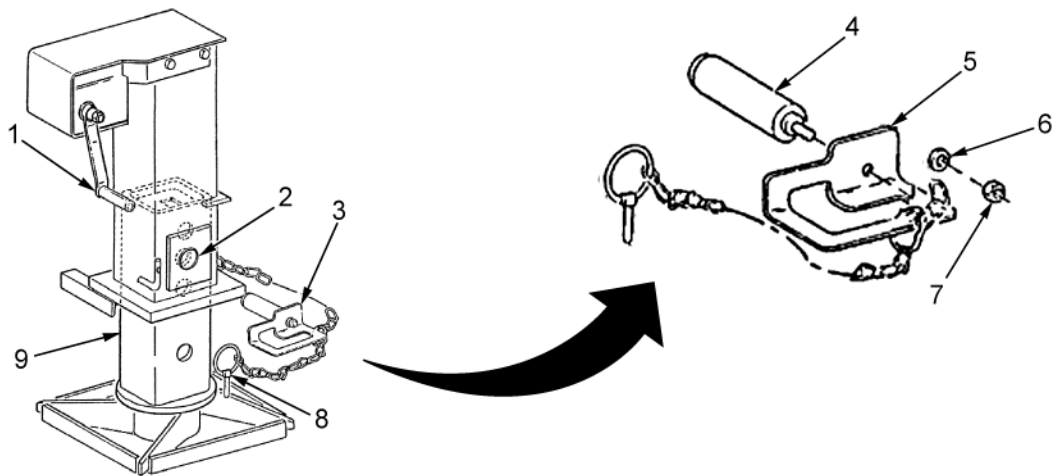
Platform adjusted to 51 in. (130 cm) height (WP 0008)
If semitrailer is uncoupled, couple or support gooseneck (WP 0013)

GENERAL INFORMATION

This work package contains instructions for the repair and assembly of the front support legs.

REPAIR**NOTE**

- Use the following procedure for either curbside or streetside front support legs. Repeat this procedure as required to complete the necessary repairs.
 - When removing latch pin out of support tube, it may be necessary to rotate handcrank slightly in either direction to relieve pressure so that pin may be extracted.
1. Unfasten lynch pin (Figure 1, Item 8), rotate latch pin (Figure 1, Item 3), and pull latch pin out of support tube (Figure 1, Item 2).
 2. If required, remove nut (Figure 1, Item 7), washer (Figure 1, Item 6), and handle (Figure 1, Item 5) from pin (Figure 1, Item 4).
 3. Turn handcrank (Figure 1, Item 1) counterclockwise and lower the inner tube assembly (Figure 1, Item 9) until it comes all the way out of support tube (Figure 1, Item 2).



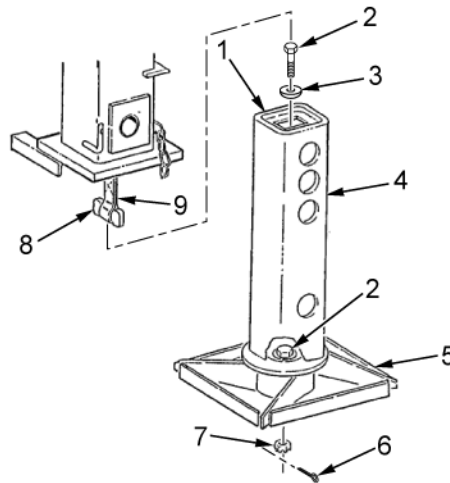
HETT0874

Figure 1. Front Support Leg Removal.

WARNING

The inner tube assembly and foot weldment are heavy. Use an assistant to support and move the assembly or injury to personnel may result.

4. Use two personnel to move inner tube assembly (Figure 2, Item 4) away from platform far enough to permit removal of anchor (Figure 2, Item 8) and strap (Figure 2, Item 9) from top of inner tube assembly. Remove anchor and strap by rotating anchor slightly until it can be extracted through rectangular opening (Figure 2, Item 1) at top of inner tube.
5. Use two personnel to lay inner tube assembly (Figure 2, Item 4) on a suitable work bench with foot weldment (Figure 2, Item 5) hanging over end or side of bench.
6. Remove cotter pin (Figure 2, Item 6) from nut (Figure 2, Item 7) on bottom side of foot weldment (Figure 2, Item 5).
7. Use extensions, 1 1/8 in. socket, and socket wrench and insert extensions with socket through top (Figure 2, Item 1) of inner tube assembly (Figure 2, Item 4) and seat socket on head of bolt (Figure 2, Item 2).
8. One person must use socket wrench attached to extension and socket to hold bolt (Figure 2, Item 2) while second person, using a 1 1/8 in. impact socket and socket wrench, must remove slotted nut (Figure 2, Item 7) and foot weldment (Figure 2, Item 5) from inner tube assembly (Figure 2, Item 4).
9. Remove loose bolt (Figure 2, Item 2) and shim (Figure 2, Item 3) from inner tube assembly (Figure 2, Item 4).



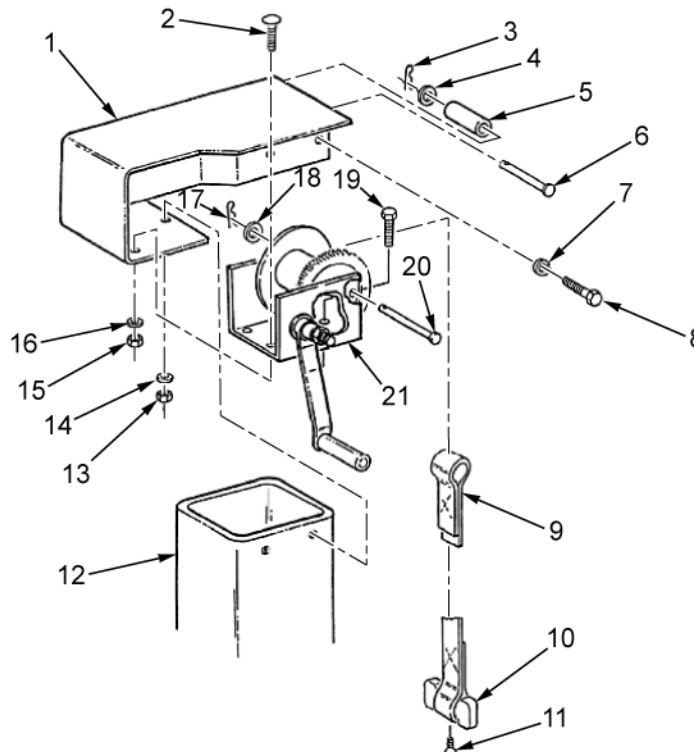
HETT0875

Figure 2. Front Support Leg Removal.

WARNING

The cover assembly containing the drum winch is unevenly balanced. Use one person to support cover assembly while second person removes attaching hardware or injury to personnel may result.

10. Remove four screws (Figure 3, Item 8), lockwashers (Figure 3, Item 7), and cover assembly (Figure 3, Item 1) containing winch drum (Figure 3, Item 21) from inner tube assembly (Figure 3, Item 12). Discard lockwashers.
11. Remove cotter pin (Figure 3, Item 3), pin (Figure 3, Item 6), washer (Figure 3, Item 4), and roller (Figure 3, Item 5) from cover assembly (Figure 3, Item 1). Discard cotter pin.
12. Remove two locknuts (Figure 3, Item 15), washers (Figure 3, Item 16), and carriage bolts (Figure 3, Item 2) from cover assembly (Figure 3, Item 1). Remove locknut (Figure 3, Item 13), washer (Figure 3, Item 14), capscrew (Figure 3, Item 19), and winch drum (Figure 3, Item 21) from cover assembly. Discard locknuts.
13. Remove cotter pin (Figure 3, Item 17), washer (Figure 3, Item 18), and pin (Figure 3, Item 20) from winch drum assembly (Figure 3, Item 21). Discard cotter pin.
14. Pull strap (Figure 3, Item 9) from winch drum (Figure 3, Item 21). If strap or anchor (Figure 3, Item 10) requires replacement, remove screw (Figure 3, Item 11) that secures strap to anchor.



HETT0876

Figure 3. Front Support Leg Disassembly.

WARNING

Cleaning compound solvent is used to clean parts and is potentially dangerous to personnel. Extinguish all smoking materials and do not allow sparks or open flame near the work area. Use skin and eye protection and work in a well-ventilated area. Failure to follow this warning may result in injury to personnel.

15. Clean inner tube (Figure 4, Item 3), foot weldment (Figure 4, Item 5), screw (Figure 4, Item 6), and cover assembly (Figure 4, Item 1). Use cleaning solvent, wire brush, and crocus cloth for degreasing and removal of corrosion.
16. Clean all parts removed from cover assembly (Figure 4, Item 1) in degreaser tank with cleaning compound solvent and wire brush as necessary. Remove corrosion using wire brush and crocus cloth.
17. Check winch drum assembly (Figure 4, Item 10) as follows:
 - a. Visually check that ratchet mechanism spring is not deformed or broken.
 - b. Check that ratchet mechanism lever is not worn, bent, or broken. Ensure ratchet mechanism locks into gear (Figure 4, Item 2) when winch drum assembly (Figure 4, Item 10) is not turning. Ensure excess paint and other foreign materials have been cleaned from ratchet gear.
 - c. Check that winch drum assembly (Figure 4, Item 10) rotates without binding or slipping when handcrank (Figure 4, Item 9) is turned. Replace winch drum assembly if improper operation is observed or any parts are defective.
18. Check lifting strap (Figure 4, Item 8) for evidence of wear, fraying, cuts, separation, and other forms of deterioration. Replace strap or anchor (Figure 4, Item 7) if defective.
19. Check inner tube assembly (Figure 4, Item 3) as follows:
 - a. Check tube (Figure 4, Item 3) weldment for cracks, broken welds, or warping. Inspect ball joint (Figure 4, Item 4) surface at bottom of tube for gouges or burrs that could restrict movement of foot weldment (Figure 4, Item 5).
 - b. Inspect foot weldment (Figure 4, Item 5) for cracks, broken welds, gouges, and burrs.
20. Inspect upper support (Figure 4, Item 14) weldment for cracks, broken welds, or warping. Inspect latch pin (Figure 4, Item 11), linch pin (Figure 4, Item 13), and split ring (Figure 4, Item 12). Replace any defective parts.

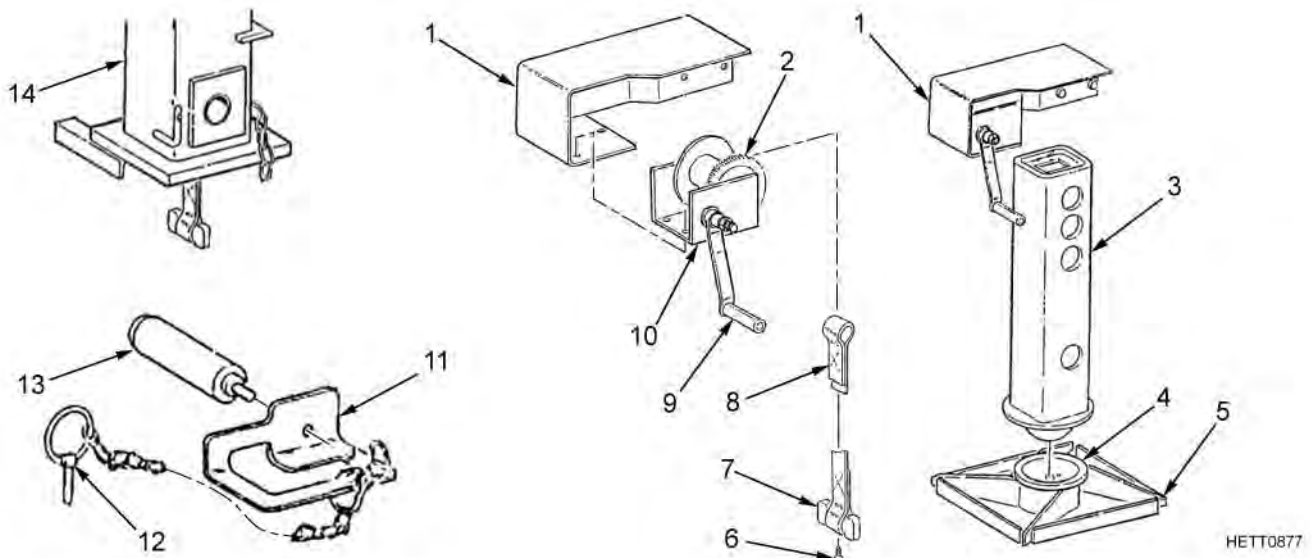


Figure 4. Front Support Legs Cleaning and Inspection.

END OF TASK

ASSEMBLY

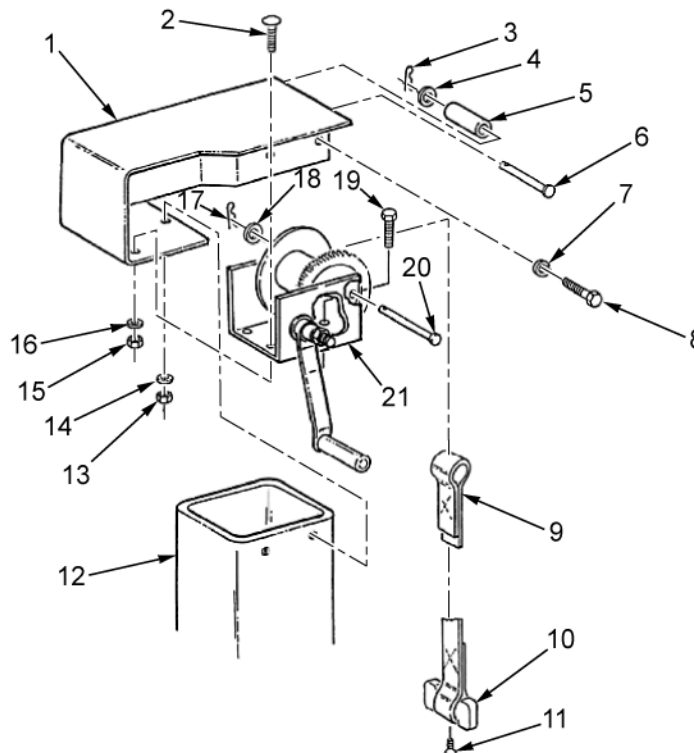
1. If anchor (Figure 5, Item 10) was removed from strap (Figure 5, Item 9), install anchor into open end of strap and secure with screw (Figure 5, Item 11). Install strap on winch drum assembly (Figure 5, Item 21) and insert pin (Figure 5, Item 20) through side of winch drum assembly and loop on end of strap. Secure pin with washer (Figure 5, Item 18) and cotter pin (Figure 5, Item 17).
2. Install winch drum (Figure 5, Item 21) on cover assembly (Figure 5, Item 1) and secure with capscrew (Figure 5, Item 19), washer (Figure 5, Item 14), locknut (Figure 5, Item 13), two carriage bolts (Figure 5, Item 2), washers (Figure 5, Item 16), and locknuts (Figure 5, Item 15).
3. Pass strap (Figure 5, Item 9) over roller (Figure 5, Item 5) and install roller with pin (Figure 5, Item 6), washer (Figure 5, Item 4), and cotter pin (Figure 5, Item 3) on cover assembly (Figure 5, Item 1).

WARNING



The cover assembly containing the winch drum is unevenly balanced. Use one person to support cover assembly while second person installs attaching hardware or injury to personnel may result.

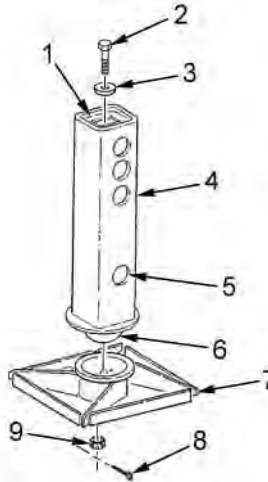
4. Install cover assembly (Figure 5, Item 1) onto support tube (Figure 5, Item 12), passing foot end of strap (Figure 5, Item 9) with anchor (Figure 5, Item 10) down through support tube. One person must support cover assembly and second person must install four capscrews (Figure 5, Item 8) and lockwashers (Figure 5, Item 7) to secure cover assembly.



HETT0876

Figure 5. Front Support Legs Assembly.

5. Assemble shim (Figure 6, Item 3) on bolt (Figure 6, Item 2) with convex side of shim downward and, working through stow hole (Figure 6, Item 5) located near bottom of inner tube (Figure 6, Item 4), insert threaded end of bolt through hole at bottom of inner tube ball joint (Figure 6, Item 6).
6. Use extensions, 1 1/8 in. socket, and socket wrench and insert extensions with socket through top (Figure 6, Item 1) of inner tube assembly (Figure 6, Item 4) and seat socket on head of bolt (Figure 6, Item 2).
7. One person must use socket wrench, extensions, and socket to hold bolt (Figure 6, Item 2), and second person must position foot weldment (Figure 6, Item 7) on ball joint of inner tube (Figure 6, Item 6) so that threaded end of bolt protrudes through mating surface of foot weldment. Second person, using a 1 1/8 in. impact socket and socket wrench, must install slotted nut (Figure 6, Item 9) and cotter pin (Figure 6, Item 8).



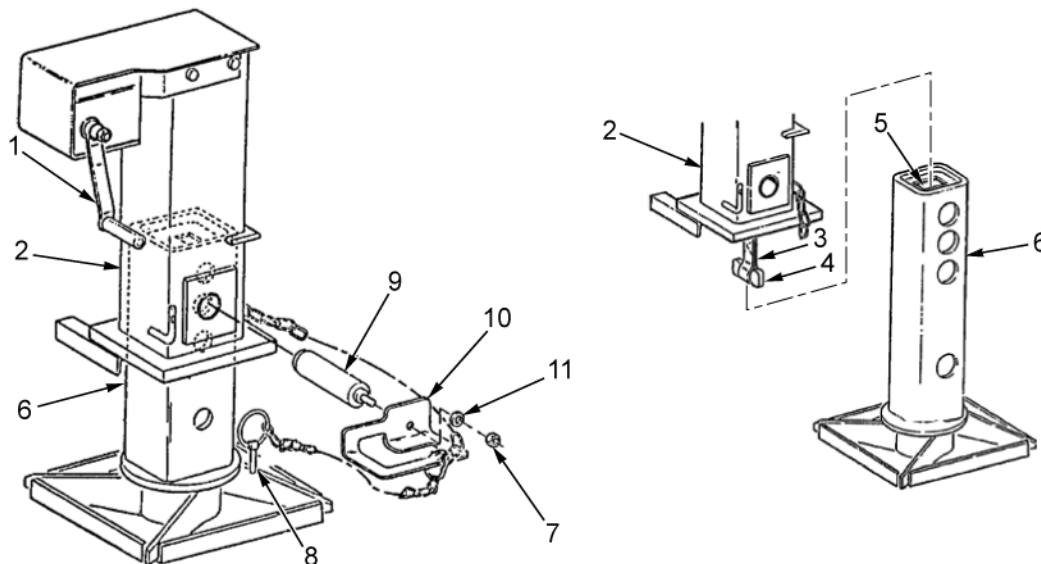
HETT0878

Figure 6. Front Support Legs Assembly.

WARNING

The inner tube and foot weldment are heavy. Use two people to support and move the assembly or injury to personnel may result.

8. Place inner tube assembly (Figure 7, Item 6) under support tube (Figure 7, Item 2). Insert anchor (Figure 7, Item 4) and strap (Figure 7, Item 3) through slot (Figure 7, Item 5) in inner tube assembly. Raise inner tube assembly and align with support tube. Turn handcrank (Figure 7, Item 1) clockwise to raise inner tube assembly.
9. If required, assemble handle (Figure 7, Item 10), washer (Figure 7, Item 11), and nut (Figure 7, Item 7) to latch pin (Figure 7, Item 9).
10. When holes are aligned, install latch pin (Figure 7, Item 9) and turn to lock in place. Install linch pin (Figure 7, Item 8) to secure latch pin.



HETT0879

Figure 7. Front Support Legs Assembly.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**REAR SUPPORT LEGS**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Packing (1)
Locknut (1)
QuickLink (1)

Materials/Parts

Brush Scrub (WP 0170, Item 3)
Crocus Cloth, Abrasive (WP 0170, Item 6)
Detergent, General Purpose (WP 0170, Item 11)
Grease (WP 0170, Item 16)
Rag, Wiping (WP 0170, Item 23)
Solvent, Cleaning Compound (WP 0170, Item 31)
Packing (1)

Personnel Required

2

Equipment Conditions

Platform lowered to lowest position (WP 0008)
Auxiliary Power Unit (APU) running (WP 0005)
Rear support legs retracted (WP 0012)

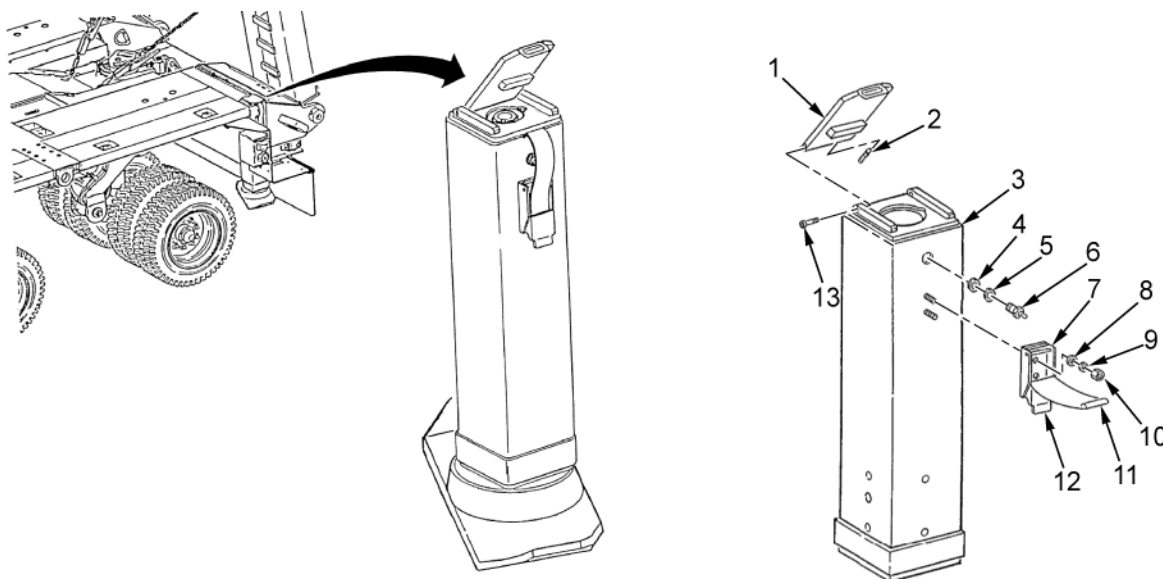
GENERAL INFORMATION

This work package contains instructions for the disassembly, repair, and assembly of the rear support legs.

DISASSEMBLY**NOTE**

Use the following procedure for either streetside or curbside rear support leg. Repeat this procedure as required to complete the necessary repairs.

1. Pull out latch handle (Figure 1, Item 12) and pull latch (Figure 1, Item 11) out of loop on cover (Figure 1, Item 1).
2. Remove two capscrews (Figure 1, Item 13) and cover (Figure 1, Item 1). Remove setscrew (Figure 1, Item 2) from cover.
3. Remove two nuts (Figure 1, Item 10), lockwashers (Figure 1, Item 9), washers (Figure 1, Item 8), and latch (Figure 1, Item 7) from support leg weldment (Figure 1, Item 3).
4. Remove lubrication fitting (Figure 1, Item 6), washer (Figure 1, Item 5), and packing (Figure 1, Item 4) from support leg weldment (Figure 1, Item 3). Discard packing.



HETT0887

Figure 1. Rear Support Leg Removal.

WARNING

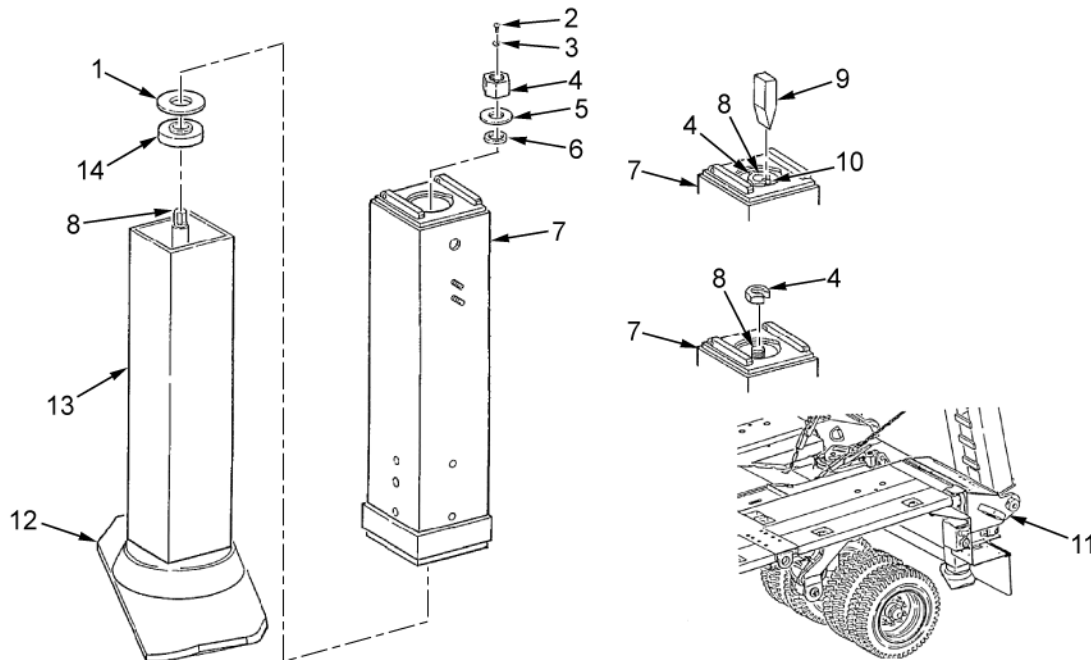
The retractable inner support leg is heavy. Keep feet and hands from under the support leg foot when raising, lowering, or operating the support leg. Use two personnel when supporting or lifting the leg or injury to personnel may result.

NOTE

Place a hydraulic floor jack under the inner support leg foot to prevent dropping of inner support leg to the ground when actuating nut is removed.

5. Place a hydraulic floor jack under foot of inner support leg (Figure 2, Item 13) and raise jack to within approximately 2 in. (3.1 cm) from bottom of foot (Figure 2, Item 12).

6. One person must hold inner support leg (Figure 2, Item 13) and second person must remove socket head screw (Figure 2, Item 2), lockwasher (Figure 2, Item 3), and actuating nut (Figure 2, Item 4) from inner support leg screw shaft (Figure 2, Item 8). If socket head screw is sheared or otherwise damaged and cannot be removed from nut and shaft, proceed as follows:
 - a. Use cold chisel (Figure 2, Item 9) and 3 lb hammer to split nut (Figure 2, Item 4) at setscrew screw hole (Figure 2, Item 10).
 - b. When nut (Figure 2, Item 4) has been split through, leave chisel (Figure 2, Item 9) in split and use a second chisel to spread nut until screw shaft (Figure 2, Item 8) of inner support leg (Figure 2, Item 13) drops from nut.
7. Remove actuating nut (Figure 2, Item 4), washer (Figure 2, Item 5), and packing (Figure 2, Item 6) from inner support leg (Figure 2, Item 13). Discard packing.
8. Raise platform to highest position (WP 0008).
9. One person must hold and steady inner support leg (Figure 2, Item 13) and second person must lower front of platform opposite affected rear support leg until inner support leg is clear of upper support leg weldment (Figure 2, Item 7). Two personnel must move inner support leg away from platform (Figure 2, Item 11).
10. Shut down Auxiliary Power Unit (APU) (WP 0005).
11. Remove sleeve bearing (Figure 2, Item 14) and washer (Figure 2, Item 1) from inner support leg (Figure 2, Item 13) screw shaft (Figure 2, Item 8).



HETT0888

Figure 2. Rear Support Leg Removal.

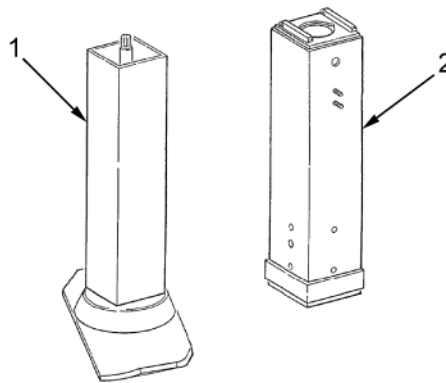
END OF TASK

REPAIR

WARNING

Cleaning compound solvent is used to clean parts and is potentially dangerous to personnel. Extinguish all smoking materials and do not allow sparks or open flame near the work area. Use skin and eye protection and work in a well-ventilated area. Failure to follow this warning may result in injury to personnel.

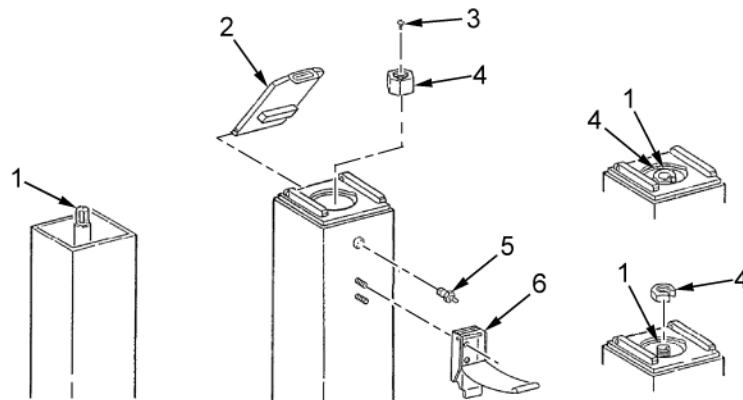
1. Clean inner support leg weldment (Figure 3, Item 1) and upper support weldment (Figure 3, Item 2) using general purpose detergent and scrub brush. Use cleaning solvent, wire brush, and crocus cloth for degreasing and removal of corrosion.
2. Inspect inner support leg (Figure 3, Item 1) for cracks, broken welds, warping, peeling of paint, and corrosion.
3. Inspect upper support weldment (Figure 3, Item 2) for cracks, broken welds, or warping. Replace any defective parts.



HETT0889

Figure 3. Rear Support Leg Inspection.

4. Repair of rear support leg is limited to replacement of defective cover (Figure 4, Item 2), latch (Figure 4, Item 6), and lubrication fitting (Figure 4, Item 5).
5. Additional repair, required only if actuating nut (Figure 4, Item 4) is destroyed during disassembly, consists of restoration of threaded top end of screw shaft (Figure 4, Item 1) prior to installation of a new nut and socket head screw (Figure 4, Item 3). To repair screw shaft, proceed as follows:
 - a. Use a 1.0 to 14 UNF thread-cutting die to restore threads to screw shaft (Figure 4, Item 1) damaged during removal of actuating nut (Figure 4, Item 4). Clean off metal particles with wire brush and wiping rag.
 - b. Install a new nut (Figure 4, Item 4) on threaded end of screw shaft (Figure 4, Item 1) and thread on nut until top of nut is flush with top of shaft and setscrew slot in nut is aligned with setscrew slot in shaft.
 - c. Use a 0.3215 to 18 thread-cutting tap to restore threads in shaft slot that were damaged during removal of nut (Figure 4, Item 4) and setscrew. Remove nut and clean off metal particles with wire brush and wiping rag.
 - d. Proceed to step 1 of assembly.



HETT0890

Figure 4. Rear Support Leg Repair.

END OF TASK

ASSEMBLY

1. Apply generous amount of grease to inside top of inner support leg (Figure 5, Item 22). Use hammer and drift to install sleeve bearing (Figure 5, Item 24) and washer (Figure 5, Item 1).
2. Start APU (WP 0005).
3. With platform raised to highest position (WP 0008) and front of platform opposite affected rear support leg lowered, two personnel must raise inner support leg (Figure 5, Item 22) into upper support weldment (Figure 5, Item 10).
4. Lower platform to lowest position (WP 0008).
5. Shut down APU (WP 0005).

CAUTION

Do not use excessive force when installing socket head screw. Socket head screw may break, requiring replacement of actuating nut.

6. Install new packing (Figure 5, Item 9), washer (Figure 5, Item 8), and actuating nut (Figure 5, Item 7) to threaded shaft (Figure 5, Item 23). Torque nut to 40 to 50 lb-ft (55 to 68 Nm) with setscrew slot in nut aligned with slot in threaded shaft. Install lockwasher (Figure 5, Item 6) and socket head screw (Figure 5, Item 5) to threaded shaft.
7. Install new packing (Figure 5, Item 11), washer (Figure 5, Item 12), and lubrication fitting (Figure 5, Item 13) in upper support leg weldment (Figure 5, Item 10).
8. Position latch (Figure 5, Item 14) on studs (Figure 5, Item 20) of upper support weldment (Figure 5, Item 10) and secure with two washers (Figure 5, Item 15), lockwashers (Figure 5, Item 16), and nuts (Figure 5, Item 17).
9. Install setscrew (Figure 5, Item 4) in cover (Figure 5, Item 2) and install cover with two capscrews (Figure 5, Item 21). Adjust setscrew so that cover cannot be opened past 90 degrees vertically. Check that cover, when released at full open vertical position, returns to closed position.
10. Retract inner support leg (WP 0012). Position adjusting nut (Figure 5, Item 4) so that socket head screw (Figure 5, Item 5) is outboard, and then pull latch (Figure 5, Item 18) through loop (Figure 5, Item 3) on cover (Figure 5, Item 2) and latch handle (Figure 5, Item 19) to secure cover.

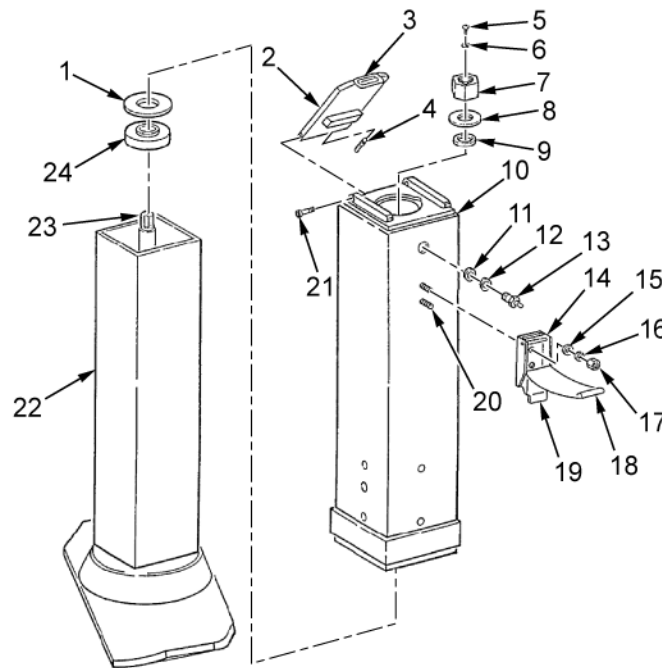


Figure 5. Rear Support Leg Assembly.

HETT0895

END OF TASK

FOLLOW-ON MAINTENANCE

Lubricate lubrication fitting and actuating nut (WP 0163).

Operate rear support leg and check for proper operation (WP 0012).

END OF WORK PACKAGE

FIELD MAINTENANCE**SPLASH GUARDS**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)

Materials/Parts

Lockwasher (12)

Personnel Required

1

Equipment Conditions

Platform adjusted to 50 in. (127 cm) height (WP 0008)

Bogies isolated at all four corners (WP 0004)

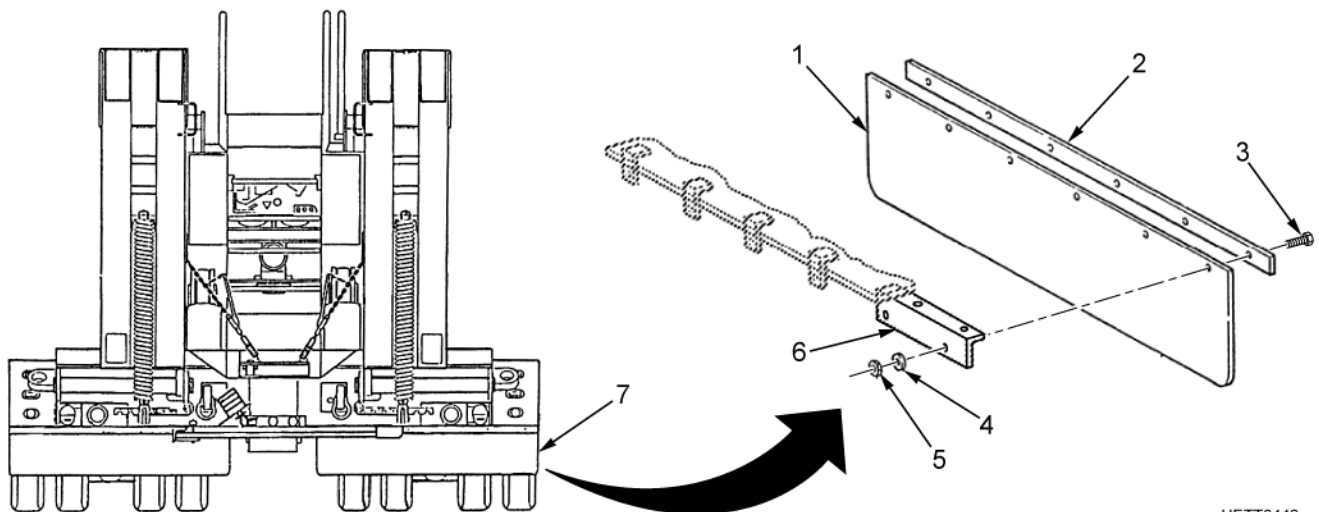
GENERAL INFORMATION

This work package contains instructions for the removal and installation of the splash guards.

REMOVAL**NOTE**

Use the following procedure for either curbside or streetside splash guards. Repeat this procedure as required to complete the necessary repairs.

1. Remove six nuts (Figure 1, Item 5), lockwashers (Figure 1, Item 4), screws (Figure 1, Item 3), and curbside splash guard (Figure 1, Item 1) with mending plate (Figure 1, Item 2) and weldment brackets (Figure 1, Item 6) from platform (Figure 1, Item 7). Discard lockwashers.



HETT0448

Figure 1. Splash Guard Removal.

END OF TASK

INSTALLATION

1. Align mending plate (Figure 2, Item 2) and curbside splash guard (Figure 2, Item 1) with weldment brackets (Figure 2, Item 6) on platform (Figure 2, Item 7) and secure with six screws (Figure 2, Item 3), new lockwashers (Figure 2, Item 4), and nuts (Figure 2, Item 5).

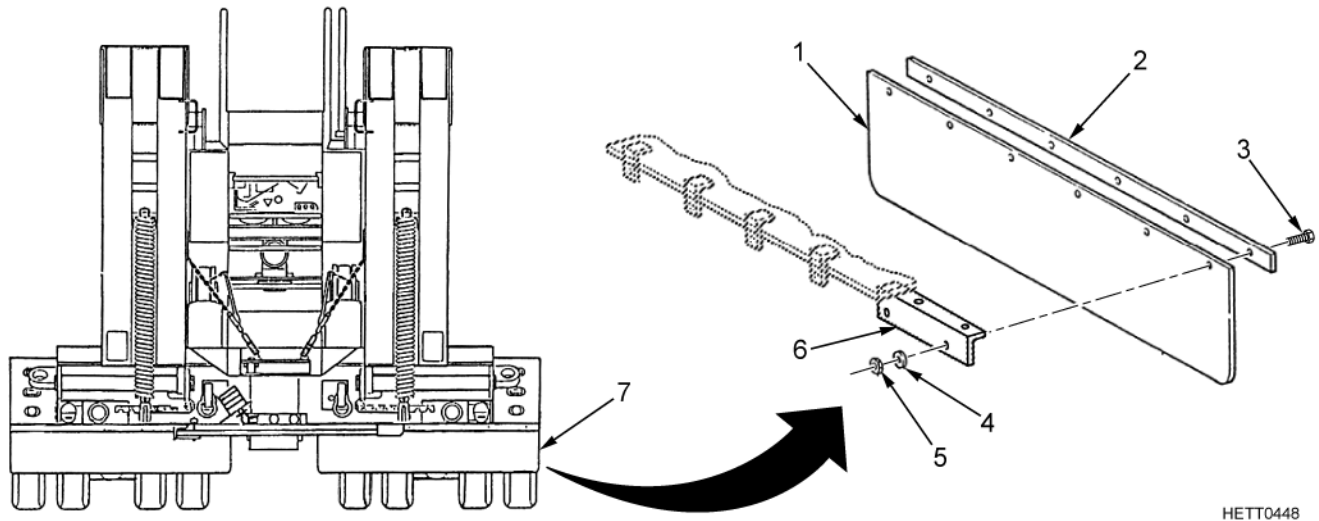


Figure 2. Splash Guard Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
CONTROL MODULE FRAME

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)

Personnel Required

2

Materials/Parts

Lockwasher (6)
Lockwasher (3)
Locknut (2)
Locknut (2)
Locknut
Screw, Self-Locking (2)

Equipment Conditions

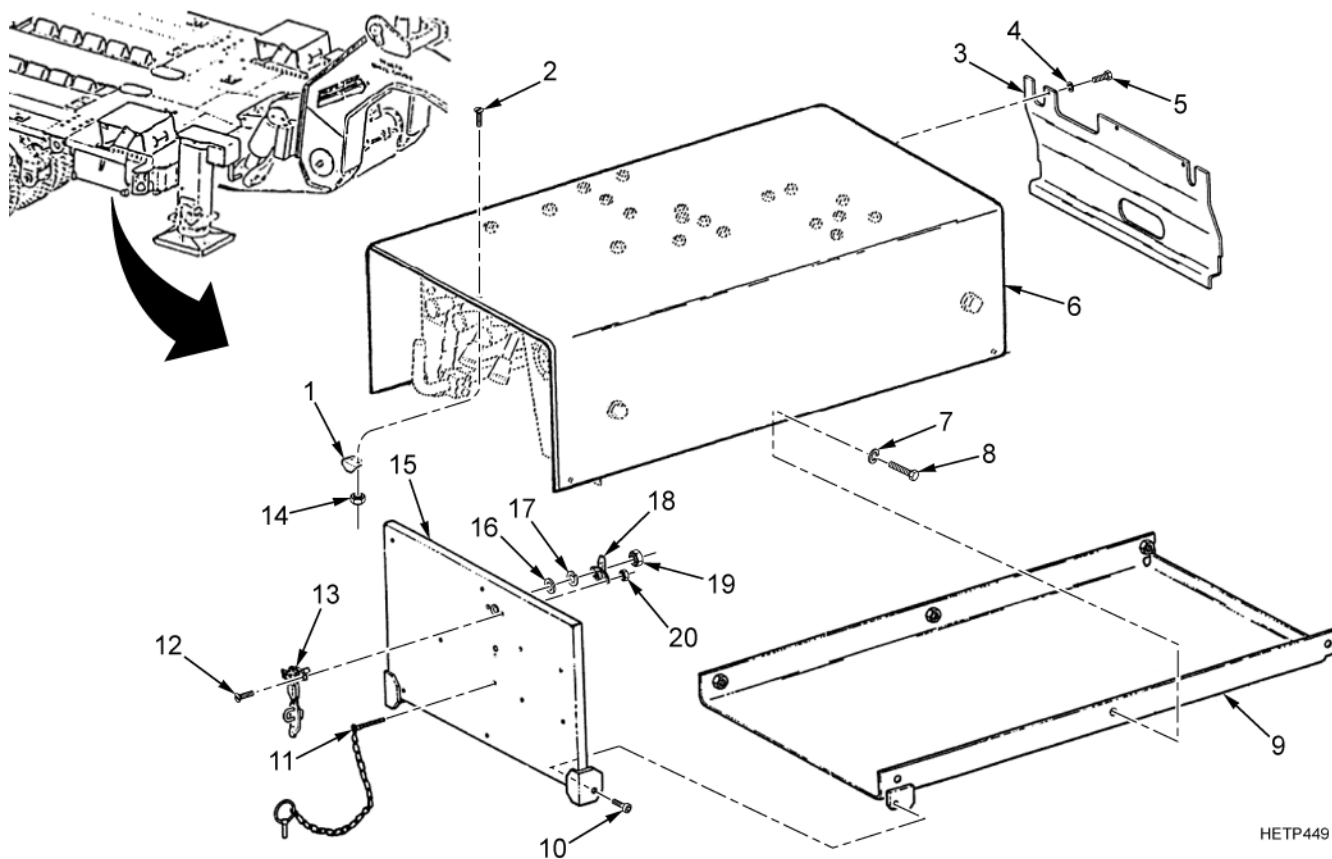
Platform adjusted to 50 in. (127 cm) height (WP 0008)
Bogies isolated at all four corners (WP 0004)
Parking brakes applied and semitrailer wheels chocked (WP 0013)
Gooseneck isolation valve handle removed (WP 0115)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the control module frame.

REMOVAL

1. Remove cotter pin (Figure 1, Item 11) from hasp (Figure 1, Item 13). Rotate hasp and lower door panel (Figure 1, Item 15). Remove cotter pin from door panel.
2. Remove two self-locking screws (Figure 1, Item 10) and door panel (Figure 1, Item 15) from lower panel (Figure 1, Item 9). Discard self-locking screws.
3. Use two people to remove six bolts (Figure 1, Item 8), lockwashers (Figure 1, Item 7), and lower panel (Figure 1, Item 9) from hydraulic control module frame (Figure 1, Item 6). Move lower panel out from under semitrailer. Discard lockwashers.
4. Remove three screws (Figure 1, Item 5), lockwashers (Figure 1, Item 4), and rear panel (Figure 1, Item 3) from hydraulic control module frame (Figure 1, Item 6). Discard lockwashers.
5. Remove two locknuts (Figure 1, Item 14), screws (Figure 1, Item 2), and angle bracket (Figure 1, Item 1) from hydraulic control module frame (Figure 1, Item 6). Discard locknuts.
6. Remove locknut (Figure 1, Item 19) from hasp (Figure 1, Item 13). Remove hasp locking mechanism (Figure 1, Item 18), spring tension washer (Figure 1, Item 17), and flat washer (Figure 1, Item 16) from hasp. Discard locknut.
7. Remove two locknuts (Figure 1, Item 20), screws (Figure 1, Item 12), and hasp (Figure 1, Item 13) from door panel (Figure 1, Item 15). Discard locknuts.



HETP449

Figure 1. Control Module Frame Removal.

END OF TASK

INSTALLATION

1. Install hasp (Figure 2, Item 13) onto door panel (Figure 2, Item 15) and secure with two screws (Figure 2, Item 12) and new locknuts (Figure 2, Item 20).
2. Install flat washers (Figure 2, Item 16), spring tension washer (Figure 2, Item 17), and hasp locking mechanism (Figure 2, Item 18) onto hasp (Figure 2, Item 13) on door panel (Figure 2, Item 15). Secure in place by installing new locknut (Figure 2, Item 19).
3. Install two screws (Figure 2, Item 2) through top of hydraulic control module frame (Figure 2, Item 6). Install angle bracket (Figure 2, Item 1) onto two screws (Figure 2, Item 2) and secure with two new locknuts (Figure 2, Item 14).
4. Align and install rear panel (Figure 2, Item 3) onto hydraulic control module frame (Figure 2, Item 6) and secure with three new lockwashers (Figure 2, Item 4) and screws (Figure 2, Item 5).
5. Use two people to align and install lower panel (Figure 2, Item 9) onto hydraulic control module frame (Figure 2, Item 6) and secure with six new lockwashers (Figure 2, Item 7) and bolts (Figure 2, Item 8).
6. Align and install door panel (Figure 2, Item 15) with lower panel (Figure 2, Item 9) and secure with two new self-locking screws (Figure 2, Item 10).
7. Install cotter pin (Figure 2, Item 11) onto door panel (Figure 2, Item 15). Close door panel and rotate hasp (Figure 2, Item 13) to secure in place. Install cotter pin onto hasp.

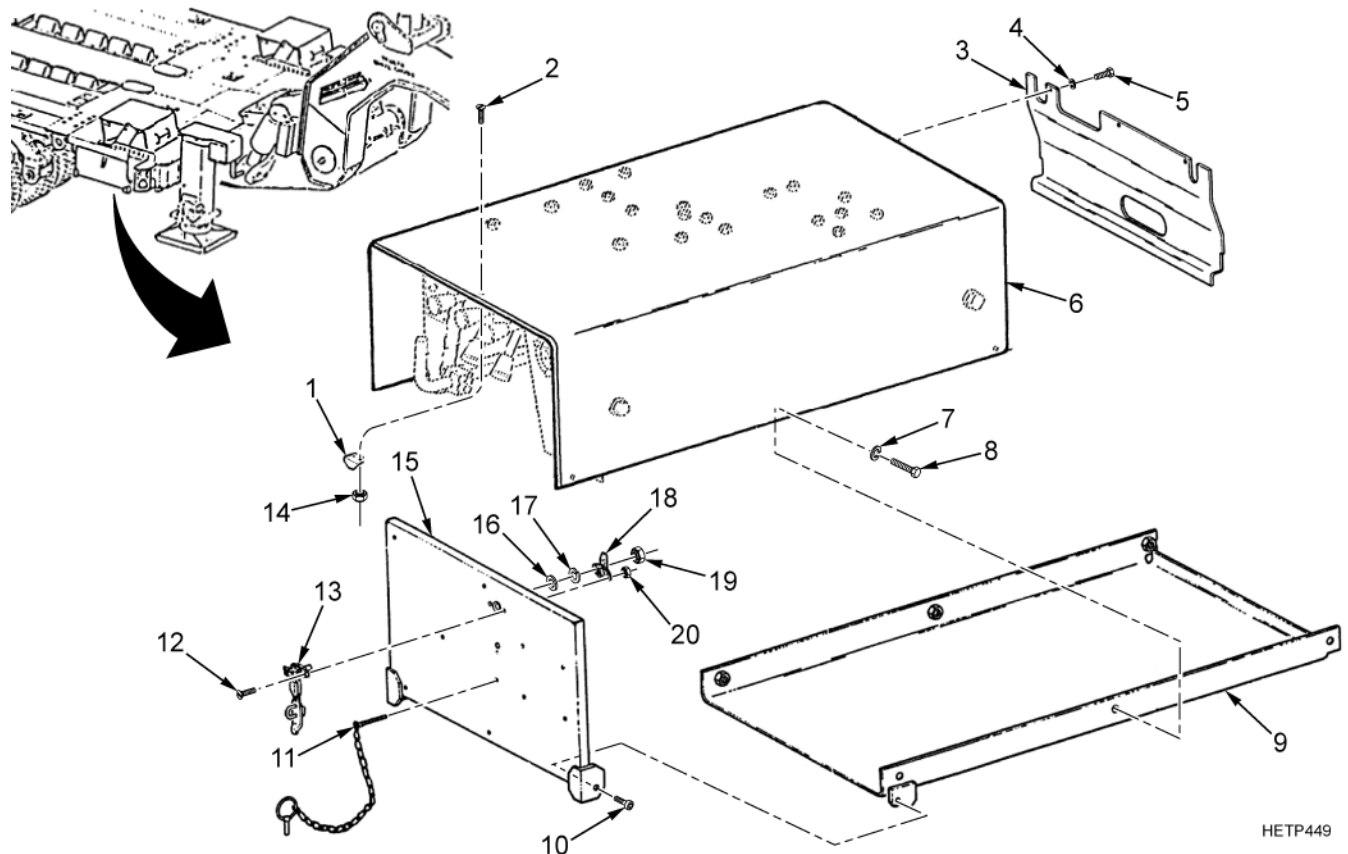


Figure 2. Control Module Frame Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**DEFLECTORS**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)

Personnel Required

1

Materials/Parts

Locknut (8)

Lockwasher (8)

Equipment ConditionsTractor/semitrailer uncoupled (WP 0013)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the deflectors.

REMOVAL**NOTE**

Use the following procedure for either curbside or streetside deflectors. Repeat this procedure as required to complete the necessary repairs.

1. Tag and disconnect electrical leads from clearance lights (WP 0050) on deflector (Figure 1, Item 3) and access cover (Figure 1, Item 9).
2. Remove four capscrews (Figure 1, Item 7) and lockwashers (Figure 1, Item 6) that secure access cover (Figure 1, Item 9) to deflector (Figure 1, Item 3). Discard lockwashers.
3. Separate access cover (Figure 1, Item 9) from deflector (Figure 1, Item 3) and remove clearance lights from access cover and deflector (WP 0050).
4. Remove cable clamps (connector clips on semitrailer with LED lights) and W2 wiring harness leads and remove grommets (WP 0055 and WP 0060) from deflector (Figure 1, Item 3).
5. Remove reflectors (Figure 1, Item 8) from access cover (Figure 1, Item 9) and deflector (Figure 1, Item 3) (WP 0105).
6. Remove four locknuts (Figure 1, Item 1), washers (Figure 1, Item 5), capscrews (Figure 1, Item 4), and deflector (Figure 1, Item 3) from platform weldment brackets (Figure 1, Item 2). Discard locknuts.

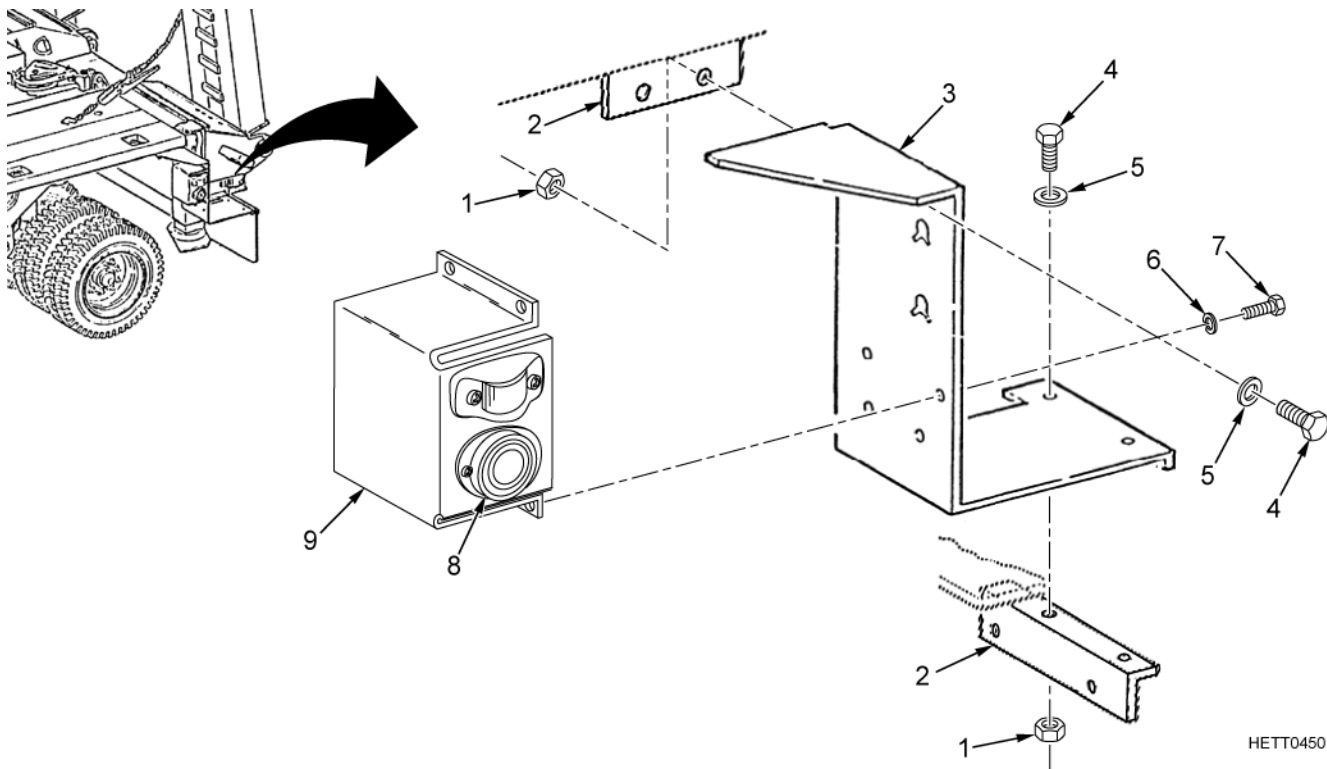
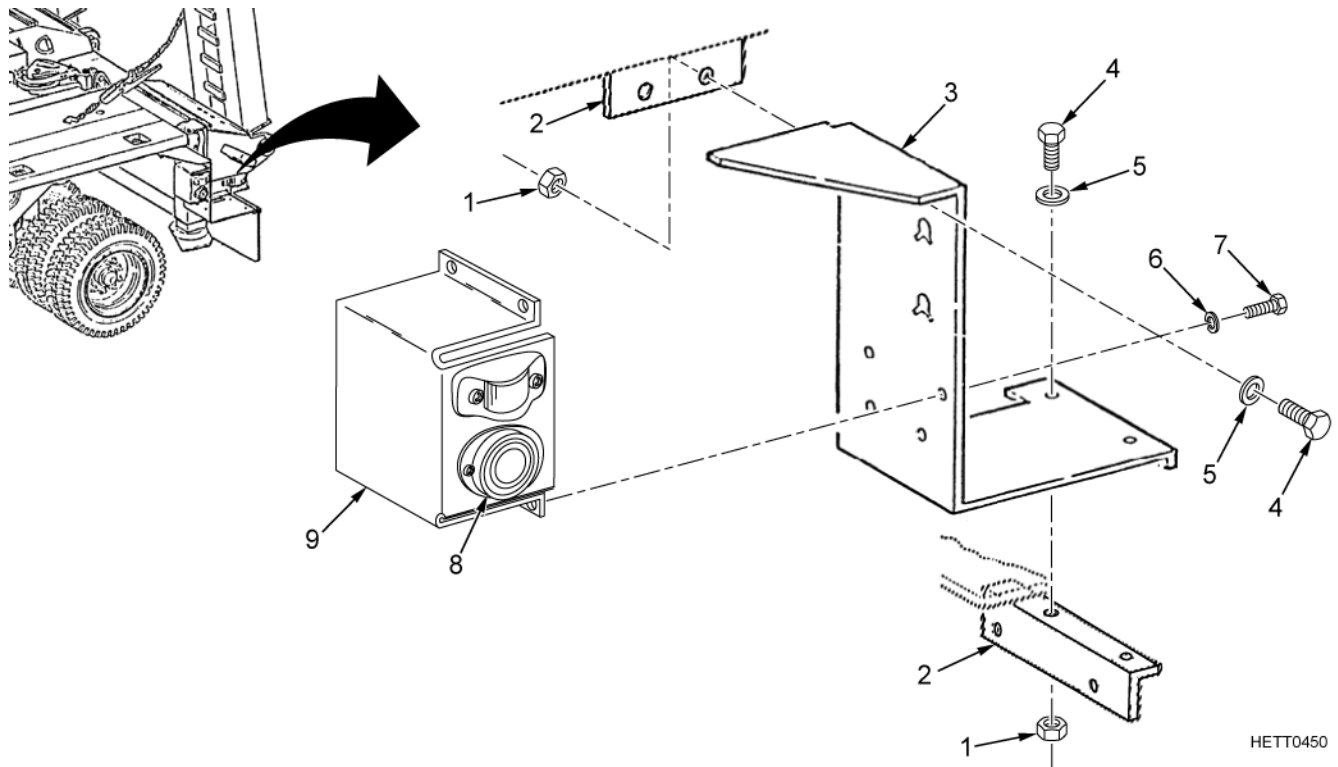


Figure 1. Deflector Removal.

END OF TASK

INSTALLATION

1. Install reflectors (Figure 2, Item 8) on access cover (Figure 2, Item 9) and deflector (Figure 2, Item 3) (WP 0105).
2. Install wiring harness grommets, W2 wiring harness leads, and harness clamps (connector clips on semitrailer with LED lights) (WP 0055 and WP 0060).
3. Install clearance lights (WP 0050).
4. Position deflector (Figure 2, Item 3) on platform weldment brackets (Figure 2, Item 2) and secure with four capscrews (Figure 2, Item 4), washers (Figure 2, Item 5), and new locknuts (Figure 2, Item 1).
5. Position access cover (Figure 2, Item 9) on deflector (Figure 2, Item 3) and install four new lockwashers (Figure 2, Item 6) and capscrews (Figure 2, Item 7).
6. Reconnect electrical leads to clearance lights (WP 0050) mounted on access cover (Figure 2, Item 9) and deflector (Figure 2, Item 3).



HETT0450

Figure 2. Deflector Installation.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**FRONT CLEARANCE LIGHT BRACKET (SOME SEMITRAILERS)**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)

Personnel Required

1

Materials/Parts

Locknut (4)

Lockwasher (1)

Equipment Conditions

Tractor/semitrailer uncoupled (WP 0013)

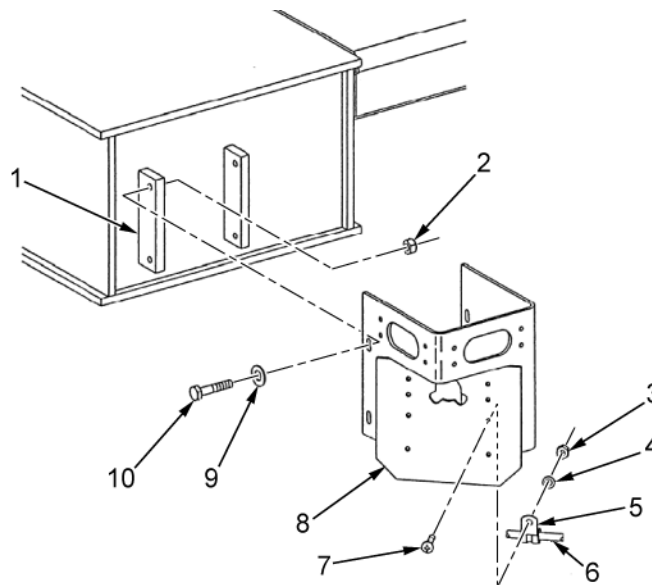
GENERAL INFORMATION

This work package contains instructions for the removal and installation of the front clearance light bracket.

REMOVAL**NOTE**

Use the following procedure for either curbside or streetside front clearance light brackets (some semitrailers). Repeat this procedure as required to complete the necessary repairs.

1. Remove clearance/blackout lights (WP 0017) from bracket (Figure 1, Item 8).
2. Remove nut (Figure 1, Item 3), lockwasher (Figure 1, Item 4), cable clamp (Figure 1, Item 5), screw (Figure 1, Item 7), and wiring harness (Figure 1, Item 6) from bracket (Figure 1, Item 8). Discard lockwasher.
3. Remove four locknuts (Figure 1, Item 2), capscrews (Figure 1, Item 10), washers (Figure 1, Item 9), and bracket (Figure 1, Item 8) from platform weldment brackets (Figure 1, Item 1). Discard locknuts.
4. Remove reflector (WP 0105) from bracket (Figure 1, Item 8).



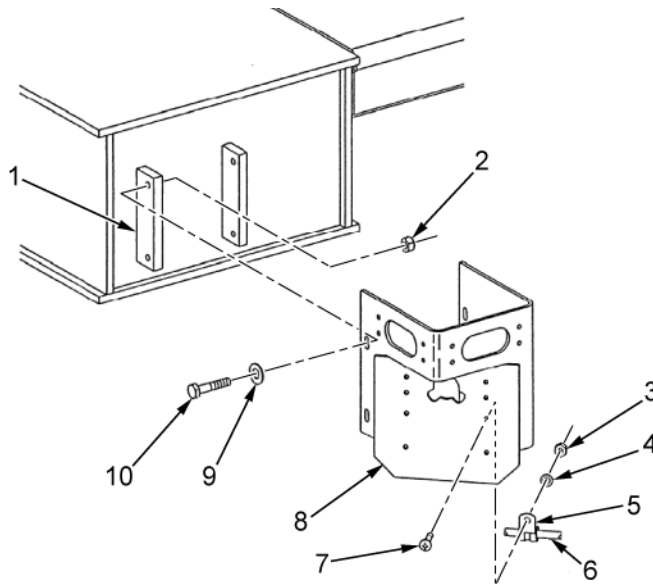
HETT0451

Figure 1. Front Clearance Light Bracket (Some Semitrailers) Removal.

END OF TASK

INSTALLATION

1. Install reflector (WP 0105) to bracket (Figure 2, Item 8).
2. Position bracket (Figure 2, Item 8) to platform weldment brackets (Figure 2, Item 1) and align bolt holes. Secure with four capscrews (Figure 2, Item 10), washers (Figure 2, Item 9), and new locknuts (Figure 2, Item 2).
3. Install wiring harness (Figure 2, Item 6), screw (Figure 2, Item 7), cable clamp (Figure 2, Item 5), new lockwasher (Figure 2, Item 4), and nut (Figure 2, Item 3) to bracket (Figure 2, Item 8).
4. Install clearance/blackout lights (WP 0017) to bracket (Figure 2, Item 8).



HETT0451

Figure 2. Front Clearance Light Bracket (Some Semitrailers) Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Reconnect intervehicular electrical cable and check clearance/blackout lights for proper operation (WP 0017).

END OF WORK PACKAGE

FIELD MAINTENANCE
STOWAGE COMPARTMENT

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Kit (WP 0168, Item 28)

Personnel Required

2

Materials/Parts

Lockwasher (4)
Self-Locking Nut (1)

Equipment Conditions

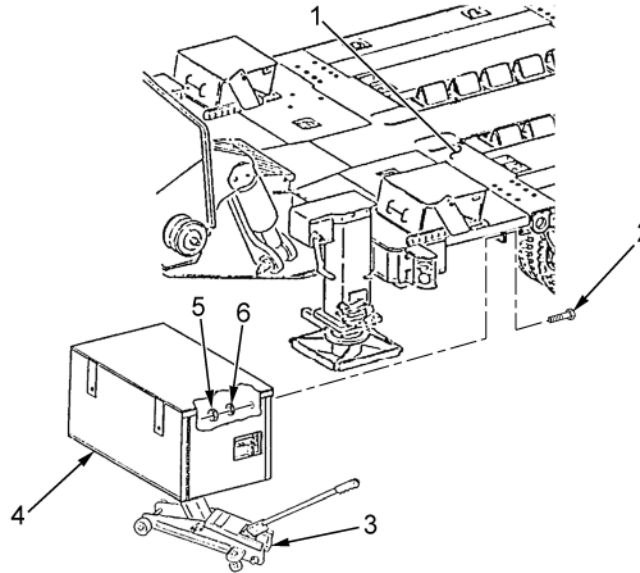
Basic Issue Items (BII) removed from stowage box and inventoried (WP 0169)

GENERAL INFORMATION

This work package contains instructions for the removal, repair, and installation of the stowage compartment.

REMOVAL

1. Loosen four nuts (Figure 1, Item 5) and screws (Figure 1, Item 2) securing platform stowage compartment (Figure 1, Item 4) to platform (Figure 1, Item 1).
2. Position hydraulic floor jack (Figure 1, Item 3) under stowage compartment (Figure 1, Item 4) and raise jack until jack makes firm contact with bottom of stowage compartment.
3. Remove four nuts (Figure 1, Item 5), lockwashers (Figure 1, Item 6), and screws (Figure 1, Item 2) securing stowage compartment to platform (Figure 1, Item 1). Discard lockwashers.
4. Use two people to steady stowage compartment (Figure 1, Item 4) on pedestal of hydraulic floor jack (Figure 1, Item 3), lower jack as necessary, and pull jack with stowage compartment from under platform (Figure 1, Item 1).



HETT0891

Figure 1. Stowage Compartment Removal.

END OF TASK

REPAIR

1. Remove self-locking nut (Figure 2, Item 1), lock tab (Figure 2, Item 2), spring washer (Figure 2, Item 3), flat washer (Figure 2, Item 4), handle (Figure 2, Item 7), and retainer washer (Figure 2, Item 6) from door of stowage compartment (Figure 2, Item 5). Discard self-locking nut.
2. Discard nut supplied with replacement handle assembly. Install retainer washer (Figure 2, Item 6) onto handle (Figure 2, Item 7). Install handle into door of stowage compartment (Figure 2, Item 5) and secure flat washer (Figure 2, Item 4), spring washer (Figure 2, Item 3), lock tab (Figure 2, Item 2), and self-locking nut (Figure 2, Item 1).

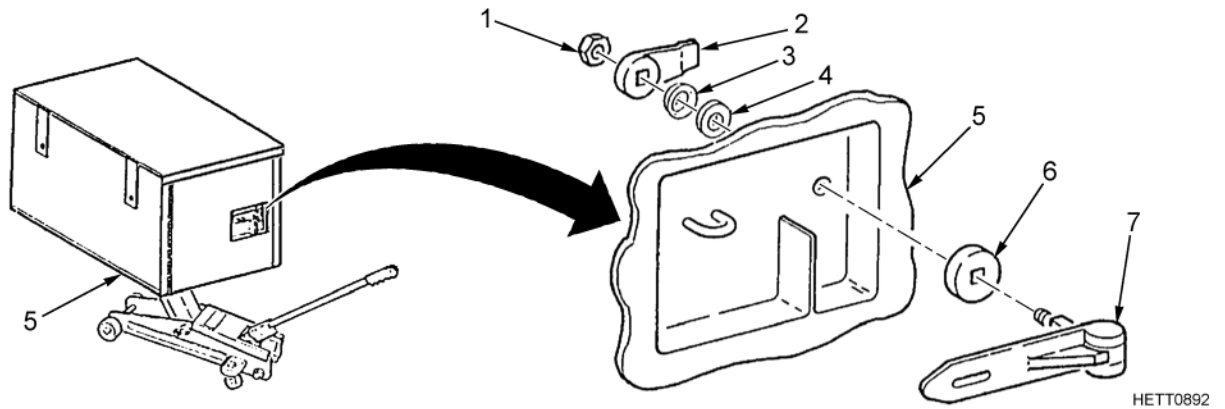
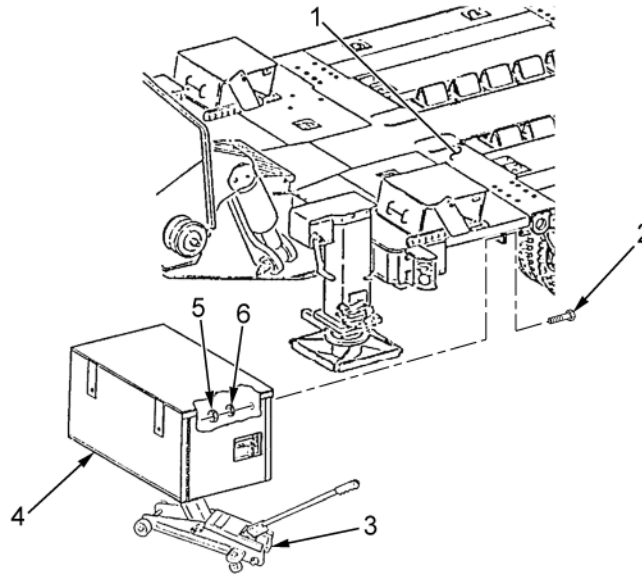


Figure 2. Stowage Compartment Repair.

END OF TASK

INSTALLATION

1. Use two people to place stowage compartment (Figure 3, Item 4) on pedestal of hydraulic floor jack (Figure 3, Item 3) and position under platform (Figure 3, Item 1). Raise stowage compartment with jack and position until compartment mounting holes are aligned with mounting holes in platform.
2. Install four screws (Figure 3, Item 2), lockwashers (Figure 3, Item 6), and nuts (Figure 3, Item 5) to secure stowage compartment (Figure 3, Item 4) to platform (Figure 3, Item 1). Lower floor jack (Figure 3, Item 3) and remove from under platform.



HETT0891

Figure 3. Stowage Compartment Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Install Basic Issue Items (BII) (WP 0169).

END OF WORK PACKAGE

FIELD MAINTENANCE**DAVIT ASSEMBLY**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Kit (WP 0168, Item 28)

Lockwasher (3)

Locknut (1)

Personnel Required

1

Materials/Parts

Crocus Cloth, Abrasive (WP 0170, Item 6)
Grease (WP 0170, Item 16)
Solvent, Cleaning Compound (WP 0170, item 31)
Lockwasher (1)

Equipment Conditions

Gooseneck supported, if uncoupled (WP 0007)

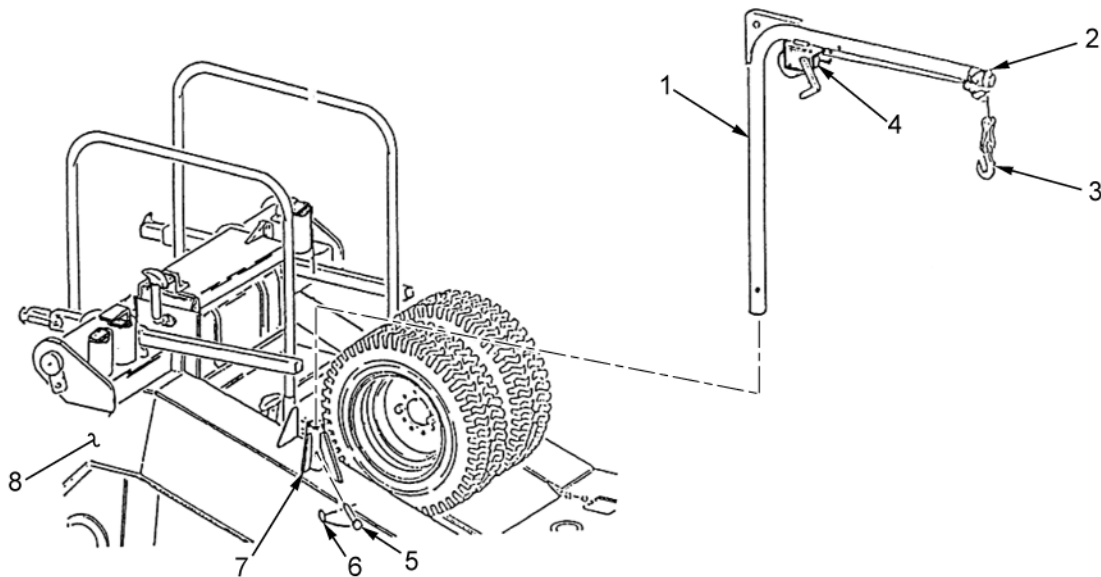
GENERAL INFORMATION

This work package contains instructions for the removal, repair, and installation of the davit assembly.

REMOVAL

WARNING

- When on top of the gooseneck and removing or installing davit assembly, always hold onto guardrails with one hand to avoid falling or injury to personnel may result.
 - On some semitrailers a solar battery charger is mounted to the top of the gooseneck directly in front of spare tires. Persons working on top of the gooseneck must take **EXTREME** care not to step on the gooseneck or trip over it. Failure to follow this warning may result in injury to personnel or damage to equipment.
1. Unhook davit cable hook (Figure 1, Item 3) from stow position on davit base (Figure 1, Item 7) and operate davit winch (Figure 1, Item 4) to raise hook up to clamp pulley (Figure 1, Item 2).
 2. Remove linch pin (Figure 1, Item 6) and pull hitch pin (Figure 1, Item 5) from davit base (Figure 1, Item 7) and davit assembly (Figure 1, Item 1).
 3. Lift davit assembly (Figure 1, Item 1) out of davit base (Figure 1, Item 7) from gooseneck (Figure 1, Item 8).



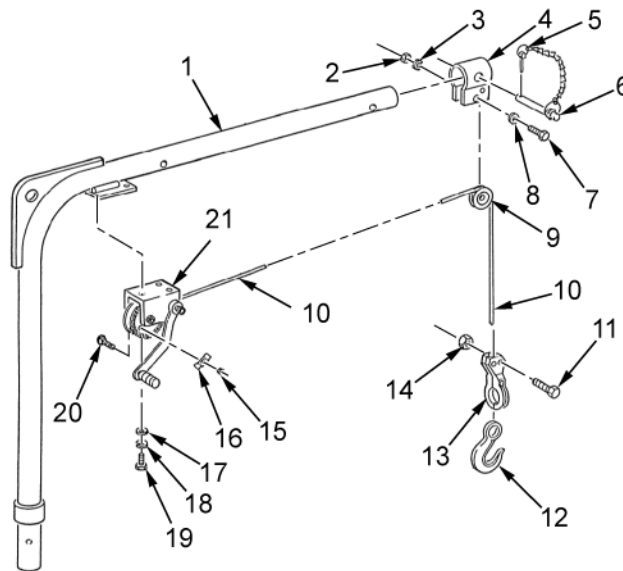
HETT0453

Figure 1. Davit Assembly Removal.

END OF TASK

REPAIR

1. Remove two nuts (Figure 2, Item 14), bolts (Figure 2, Item 11), and clamp (Figure 2, Item 13) from cable (Figure 2, Item 10). Separate clamp and remove hook (Figure 2, Item 12).
2. Remove linch pin (Figure 2, Item 5) from hitch pin (Figure 2, Item 6) and remove hitch pin from pulley clamp (Figure 2, Item 4) and davit assembly (Figure 2, Item 1).
3. Remove pulley clamp (Figure 2, Item 4) from end of davit assembly (Figure 2, Item 1).
4. Remove nut (Figure 2, Item 2), lockwasher (Figure 2, Item 3), bolt (Figure 2, Item 7), washer (Figure 2, Item 8), and pulley (Figure 2, Item 9) from pulley clamp (Figure 2, Item 4). Discard lockwasher.
5. Remove three screws (Figure 2, Item 19), lockwashers (Figure 2, Item 18), washers (Figure 2, Item 17), and winch assembly (Figure 2, Item 21) from davit assembly (Figure 2, Item 1). Discard lockwashers.
6. Remove nut (Figure 2, Item 15), bolt (Figure 2, Item 20), cable clamp (Figure 2, Item 16), and cable (Figure 2, Item 10) from drum of winch assembly (Figure 2, Item 21).



HETT0454

Figure 2. Davit Assembly Repair.

WARNING

Cleaning compound solvent is used to clean parts and is potentially dangerous to personnel. Extinguish all smoking materials and do not allow sparks or open flame near the work area. Use skin and eye protection and work in a well-ventilated area. Failure to follow this warning may result in injury to personnel.

7. Clean all parts removed in degreaser tank with cleaning compound solvent and wire brush as necessary. Remove corrosion using wire brush and crocus cloth.
8. Inspect davit assembly (Figure 3, Item 1) and davit base (Figure 3, Item 11) for corrosion, broken welds, cracks, evidence of warping, excessive dents, and peeling of painted surfaces. Repair or replace defective davit assembly.
9. Check winch assembly (Figure 3, Item 15) as follows:
 - a. Visually check that ratchet mechanism spring, not shown, is not deformed or broken.
 - b. Check that ratchet mechanism lever is not worn, bent, or broken. Ensure ratchet mechanism locks when winch drum (Figure 3, Item 14) is not being turned. Ensure excess paint and other foreign materials have been cleaned from ratchet gear (Figure 3, Item 13) and spring. Check that winch drum rotates without binding or slipping when handcrank (Figure 3, Item 12) is turned. Replace winch assembly (Figure 3, Item 15) if improper operation is observed or any parts are defective.
 - c. Check pulley clamp (Figure 3, Item 2) and ensure pulley (Figure 3, Item 7) rotates freely.
 - d. Check winch cable (Figure 3, Item 6) for evidence of wear, fraying, separation, and other forms of deterioration. Replace cable or anchor if defective.
10. Check hitch pin assemblies (Figure 3, Item 5 and Item 8). Ensure linch pins (Figure 3, Item 3 and Item 10) are attached by lanyards (Figure 3, Item 4 and Item 9) and can be locked to secure hitch pins.

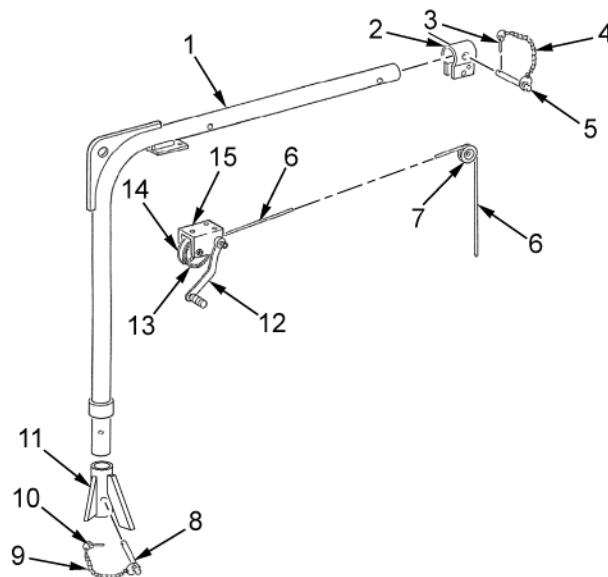
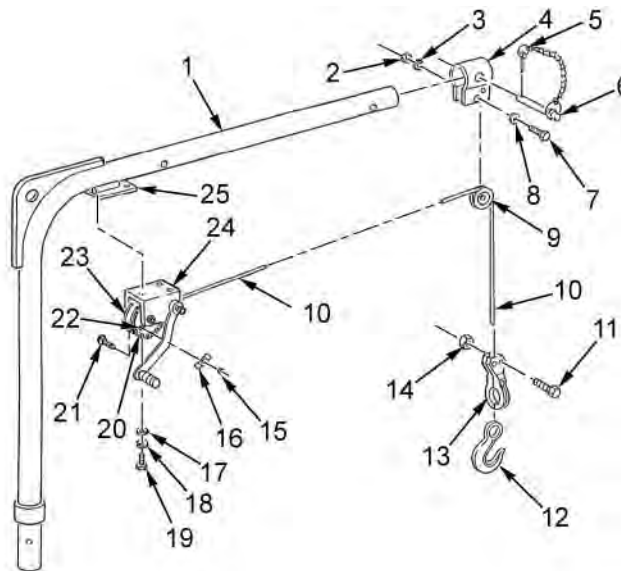


Figure 3. Davit Assembly Repair.

HETT0897

11. Pass end of cable (Figure 4, Item 10) through front of winch assembly (Figure 4, Item 24) over ratchet gearshaft (Figure 4, Item 20) and around winch drum (Figure 4, Item 23). Stick end of cable through hole (Figure 4, Item 22) on side of winch drum and secure cable to side of drum with cable clamp (Figure 4, Item 16), screw (Figure 4, Item 21), and nut (Figure 4, Item 15).
12. Position winch assembly (Figure 4, Item 24) on davit assembly (Figure 4, Item 1) bracket weldment (Figure 4, Item 25) and install three washers (Figure 4, Item 17), lockwashers (Figure 4, Item 18), and screws (Figure 4, Item 19).
13. Pass other end of winch cable (Figure 4, Item 10) over pulley (Figure 4, Item 9) and position pulley in pulley clamp (Figure 4, Item 4). Install bolt (Figure 4, Item 7) with washer (Figure 4, Item 8), lockwasher (Figure 4, Item 3), and nut (Figure 4, Item 2) on pulley clamp.
14. Install pulley clamp (Figure 4, Item 4) on end of davit assembly (Figure 4, Item 1) and insert hitch pin (Figure 4, Item 6) through pulley clamp and davit assembly. Secure hitch pin with linch pin (Figure 4, Item 5).
15. Install hook (Figure 4, Item 12) in clamp (Figure 4, Item 13) and insert end of cable (Figure 4, Item 10) in clamp. Install two bolts (Figure 4, Item 11) and nuts (Figure 4, Item 14) onto clamp.
16. Operate davit winch (Figure 4, Item 24) to raise hook (Figure 4, Item 12) up to pulley clamp (Figure 4, Item 4).



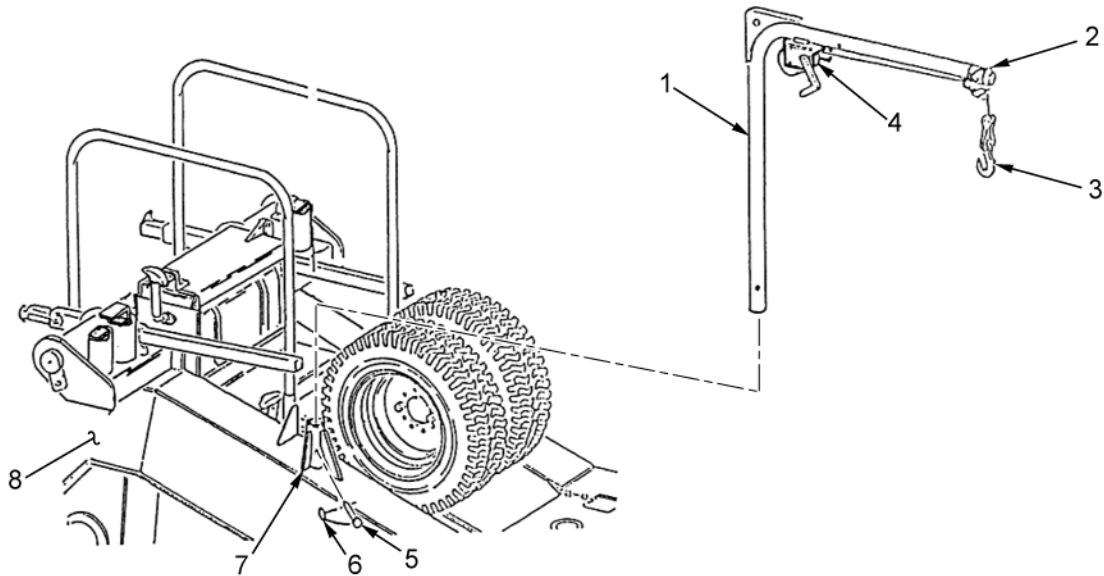
HETT0906

Figure 4. Davit Assembly Repair.

END OF TASK

INSTALLATION

1. Install davit assembly (Figure 5, Item 1) into davit base (Figure 5, Item 7) on gooseneck (Figure 5, Item 8).
2. Install hitch pin (Figure 5, Item 5) through davit base (Figure 5, Item 7) and davit assembly (Figure 5, Item 1). Secure with linch pin (Figure 5, Item 6).
3. Operate winch assembly (Figure 5, Item 4) to lower hook (Figure 5, Item 3) from pulley clamp (Figure 5, Item 2). Attach hook to stow position on davit base (Figure 5, Item 7).



HETT0453

Figure 5. Davit Assembly Installation.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**SNATCH BLOCK**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Kit (WP 0168, Item 28)

Locknut (2)
Cotter Pin (1)
Lockwasher (1)
Cotter Pin (1)

Materials/Parts

Crocus Cloth, Abrasive (WP 0170, Item 6)
Grease (WP 0170, Item 16)
Solvent, Cleaning Compound (WP 0170, Item 31)

Personnel Required

2

GENERAL INFORMATION

This work package contains instructions for the removal, repair, and installation of the snatch block.

REMOVAL

WARNING

Snatch block weighs in excess of 150 lb (68 kg). Always use two personnel when lifting snatch block or injury to personnel may result.

1. Unscrew clamp handle (Figure 1, Item 1) to unstow snatch block (Figure 1, Item 8) from platform (Figure 1, Item 2).
2. Remove hitch pin (Figure 1, Item 3), nut (Figure 1, Item 4), bolt (Figure 1, Item 6), snatch block (Figure 1, Item 8), and swivel and link assembly (Figure 1, Item 7) from platform (Figure 1, Item 2) weldment mounting block (Figure 1, Item 5).
3. Remove two locknuts (Figure 1, Item 9) and U-bolt (Figure 1, Item 11) from platform (Figure 1, Item 2).
4. Remove two nuts (Figure 1, Item 10) from U-bolt (Figure 1, Item 11) and remove U-bolt from eyebolt (Figure 1, Item 12).

NOTE

The threads on the end of the eyebolt have been deformed during installation to prevent clamp handle from unscrewing from eyebolt unless excessive torque is applied.

5. Unscrew clamp handle (Figure 1, Item 1) from eyebolt (Figure 1, Item 12). Apply torque as required to unscrew handle of end threads, which were deformed to retain clamp handle.
6. Remove lockwasher (Figure 1, Item 14) and clamp tab (Figure 1, Item 13) from eyebolt (Figure 1, Item 12).

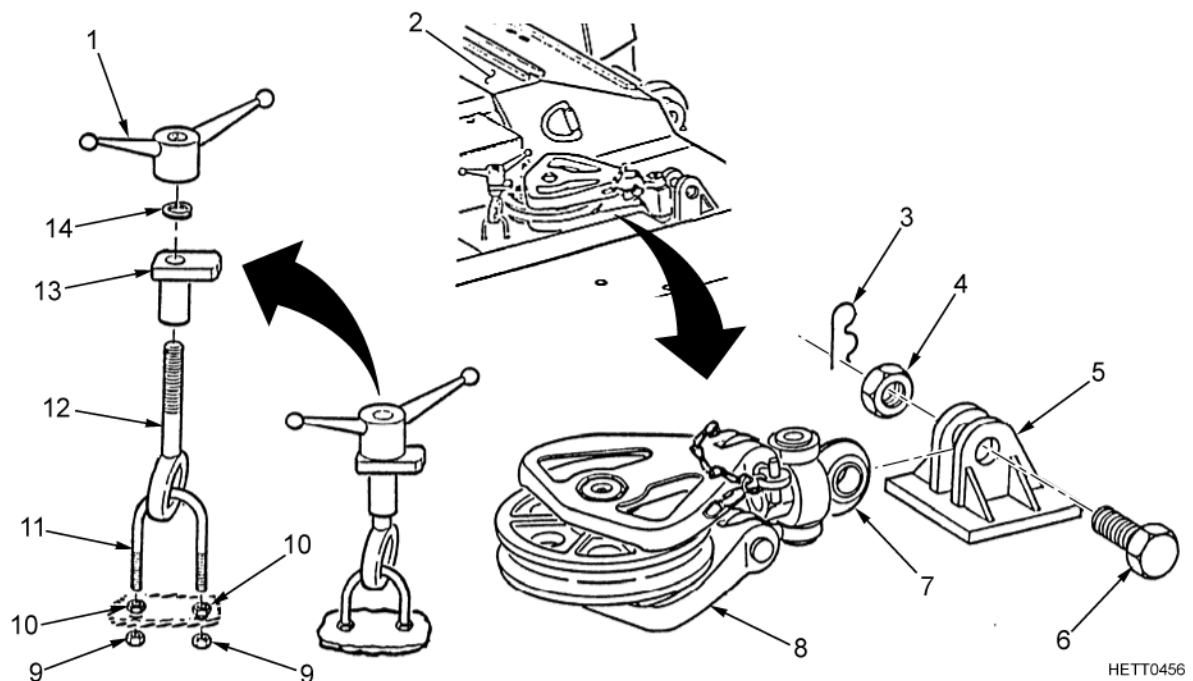
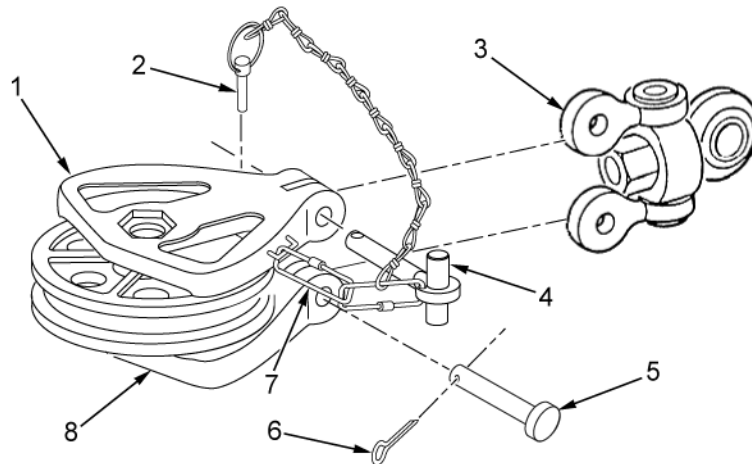


Figure 1. Snatch Block Removal.

END OF TASK

REPAIR

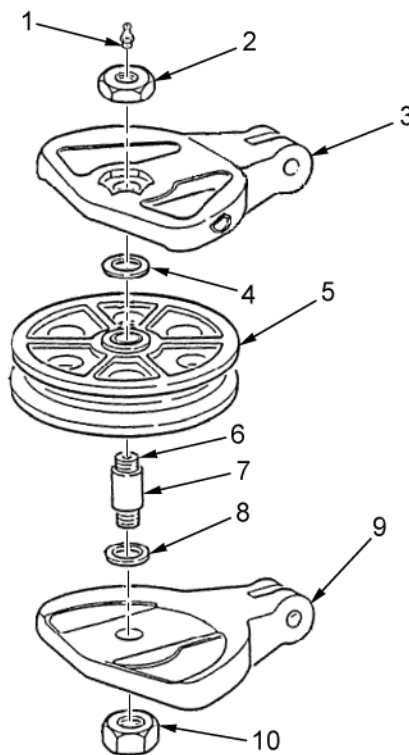
1. Remove linch pin (Figure 2, Item 2) from keeper pin assembly (Figure 2, Item 4) and pull keeper pin from upper block side (Figure 2, Item 1).
2. Unfasten quick-disconnect links (Figure 2, Item 7) and remove keeper pin assembly (Figure 2, Item 4).
3. Remove cotter pin (Figure 2, Item 6) and extract headed pin (Figure 2, Item 5) from lower block side (Figure 2, Item 8).
4. Remove swivel and eye assembly (Figure 2, Item 3) from lower block side (Figure 2, Item 8).



HETT0898

Figure 2. Snatch Block Repair.

5. Secure lower block side (Figure 3, Item 9) in a machinist's vise with vise jaw caps.
6. Use hammer to rotate upper block side (Figure 3, Item 3) counterclockwise to loosen and remove captive nut (Figure 3, Item 2) and upper block side from pulley pin (Figure 3, Item 7).
7. Remove thrust washer (Figure 3, Item 4) and pulley (Figure 3, Item 5).
8. Rotate lower block side (Figure 3, Item 9) and secure pulley pin (Figure 3, Item 7) in vise.
9. Use hammer to rotate lower block side (Figure 3, Item 9) counterclockwise to loosen and remove capture nut (Figure 3, Item 10).
10. Remove capture nut (Figure 3, Item 10), lower block side (Figure 3, Item 9), and thrust washer (Figure 3, Item 8) from pulley pin (Figure 3, Item 7).
11. Remove pulley pin (Figure 3, Item 7) from vise and remove lubrication fitting (Figure 3, Item 1) from hole (Figure 3, Item 6) in end of pulley pin.



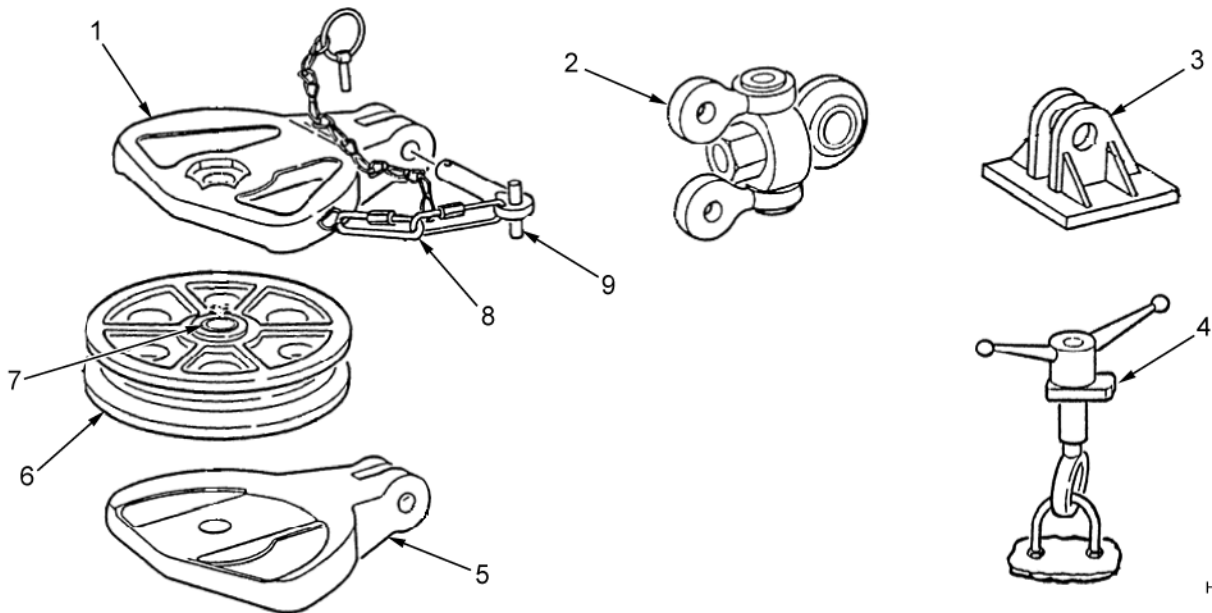
HETT0899

Figure 3. Snatch Block Repair.

WARNING

Cleaning compound solvent is used to clean parts and is potentially dangerous to personnel. Extinguish all smoking materials and do not allow sparks or open flame near the work area. Use skin and eye protection and work in a well-ventilated area. Failure to follow this warning may result in injury to personnel.

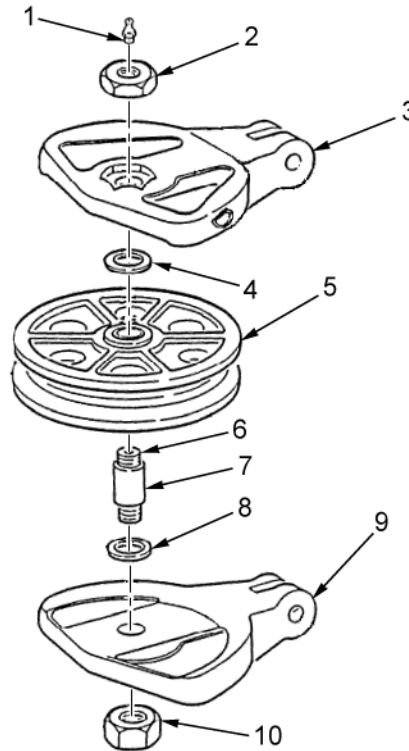
12. Clean all parts removed in degreaser tank with cleaning compound solvent and wire brush as necessary. Remove corrosion using wire brush and crocus cloth.
13. Inspect upper and lower block sides (Figure 4, Item 1 and Item 5), swivel and link assembly (Figure 4, Item 2), and mounting bracket weldment (Figure 4, Item 3) on platform for cracks, broken welds, or warping. Inspect keeper pin assembly (Figure 4, Item 9) and quick-disconnect links (Figure 4, Item 8). Replace any defective parts.
14. Inspect snatch block stow clamp assembly (Figure 4, Item 4), handle, and attaching parts. Replace any missing or defective parts.
15. Inspect snatch block pulley (Figure 4, Item 6) for any evidence of cracks or excessive wear. Check sleeve bushing (Figure 4, Item 7) installed in hub of pulley. If bushing shows signs of wear or other forms of deterioration. Replace defective parts.



HETT0900

Figure 4. Snatch Block Repair.

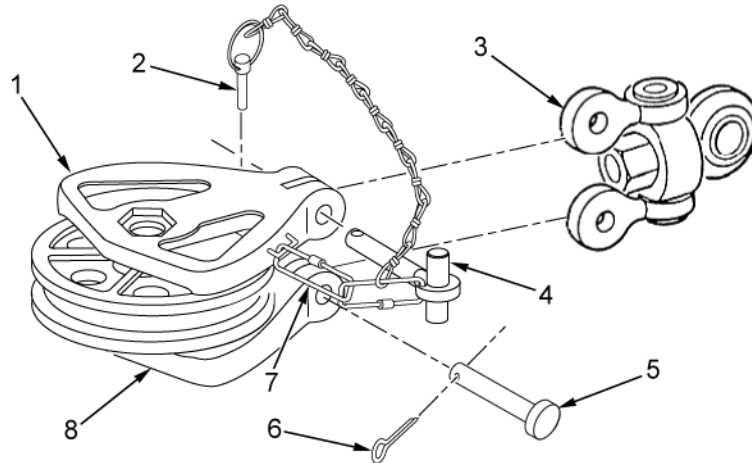
16. Install grease fitting (Figure 5, Item 1) into hole (Figure 5, Item 6) in top of pulley pin (Figure 5, Item 7).
17. Place pulley pin (Figure 5, Item 7), orientated with lubrication fitting (Figure 5, Item 1) down, into a machinist's vise with vise jaw caps.
18. Install thrust washer (Figure 5, Item 8) and lower block side (Figure 5, Item 9). Install capture nut (Figure 5, Item 10) and rotate lower block side clockwise until captive nut and lower block side are tight.
19. Remove lower block side (Figure 5, Item 9) and pulley pin (Figure 5, Item 7) from vise and secure lower block side in vise with pulley pin orientated upward. Install pulley (Figure 5, Item 5) and thrust washer (Figure 5, Item 4).
20. Place upper block side (Figure 5, Item 3) onto pulley pin (Figure 5, Item 7) and install capture nut (Figure 5, Item 2). Rotate upper block side clockwise to tighten capture nut on pulley pin. Ensure pulley (Figure 5, Item 5) rotates freely on pulley pin.



HETT0899

Figure 5. Snatch Block Repair.

21. Position swivel eye assembly (Figure 6, Item 3) and install headed pin (Figure 6, Item 5) and cotter pin (Figure 6, Item 6) to lower block side (Figure 6, Item 8). Install keeper pin (Figure 6, Item 4) and secure with lynch pin (Figure 6, Item 2). Attach quick-disconnect links (Figure 6, Item 7) to upper block side (Figure 6, Item 1). Secure keeper pin in place by installing two quick-disconnect links and lynch pin with chain to keeper pin.



HETT0898

Figure 6. Snatch Block Repair.

END OF TASK

INSTALLATION

1. Install clamp tab (Figure 7, Item 13), lockwasher (Figure 7, Item 14), and clamp handle (Figure 7, Item 1) onto eyebolt (Figure 7, Item 12). Use hammer to peen over the end threads of eyebolt to prevent handle from spinning off eyebolt when loosening clamp tab.
2. Pass one end of U-bolt (Figure 7, Item 11) through eye of eyebolt (Figure 7, Item 12). Install two nuts (Figure 7, Item 10) onto U-bolt.
3. Pass U-bolt (Figure 7, Item 11) through mounting holes in platform (Figure 7, Item 2) and secure in place by installing two locknuts (Figure 7, Item 9).

WARNING



Snatch block weighs in excess of 150 lb (68 kg). Always use two personnel when lifting snatch block or injury to personnel may result.

4. Position snatch block (Figure 7, Item 8) on platform (Figure 7, Item 2) and install bolt (Figure 7, Item 6) through mounting bracket weldment (Figure 7, Item 5) and eye of swivel and link assembly (Figure 7, Item 7). Install nut (Figure 7, Item 4) and hitch pin (Figure 7, Item 3) into link assembly and bracket weldment.
5. Restow snatch block (Figure 7, Item 8) on platform (Figure 7, Item 2) and align clamp tab (Figure 7, Item 13) over snatch block. Secure by tightening clamp handle (Figure 7, Item 1).

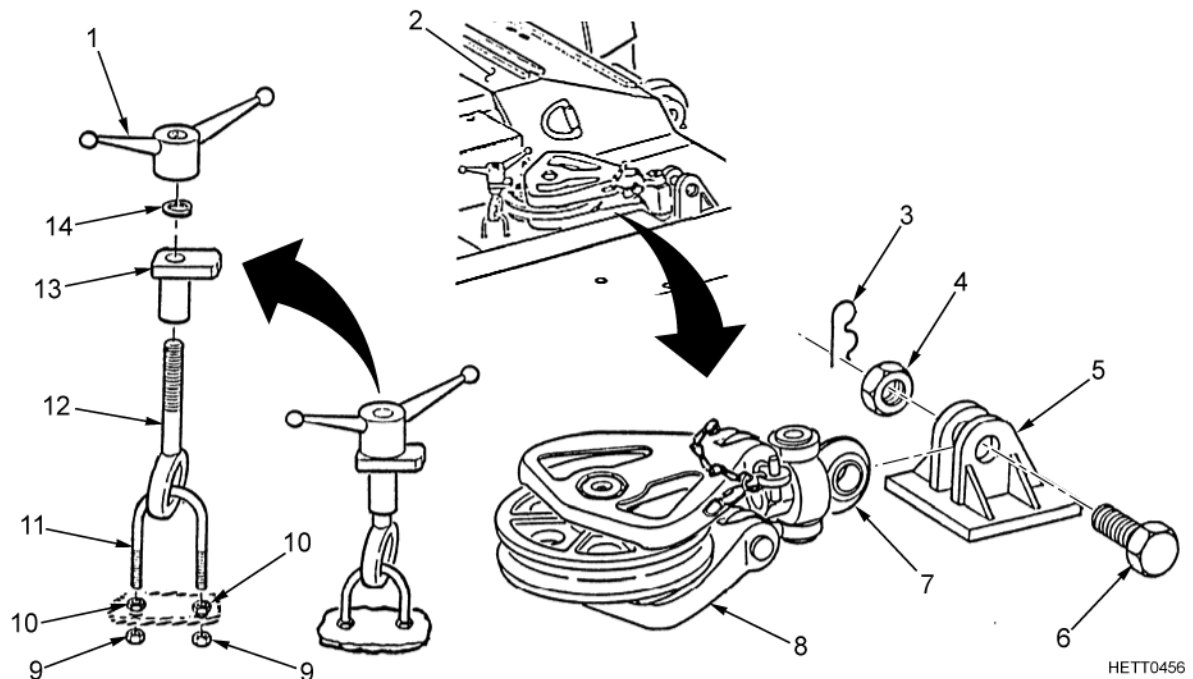


Figure 7. Snatch Block Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**CABLE GUIDE**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Kit (WP 0168, Item 28)

Locknut (2)

Personnel Required

2

Materials/Parts

Crocus Cloth, Abrasive (WP 0170, Item 6)
Grease (WP 0170, Item 16)
Solvent, Cleaning Compound (WP 0170, Item 31)
Lockwasher (8)

Equipment Conditions

Gooseneck lowered to lowest position (WP 0007)
Platform lowered to lowest position (WP 0008)

GENERAL INFORMATION

This work package contains instructions for the removal, repair, and installation of the cable guide.

REMOVAL**WARNING**

- When on top of gooseneck and removing or installing cable guides, always hold onto the guardrail with one hand to avoid falling or injury to personnel may result.
- On some semitrailers a solar battery charger is mounted to the top of the gooseneck directly in front of spare tires. Persons working on top of gooseneck must take **EXTREME** care not to step on the gooseneck or trip over it.

Failure to follow these warnings may result in serious injury to personnel or damage to equipment.

NOTE

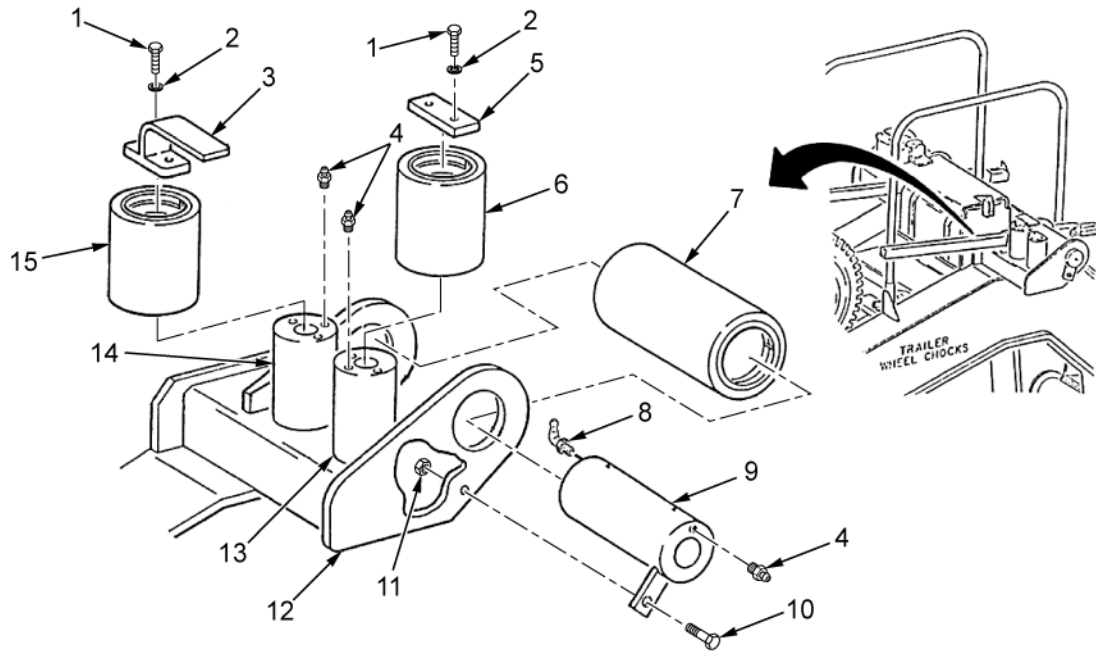
Use the following procedure for either streetside or curbside cable guides. Repeat this procedure as required to complete the necessary repairs.

1. Remove two lubrication fittings (Figure 1, Item 4 and Item 8) from roller shaft (Figure 1, Item 9).
2. Remove one lubrication fitting (Figure 1, Item 4) from top of each roller shaft (Figure 1, Item 13 and Item 14).
3. Remove capscrew (Figure 1, Item 10) and locknut (Figure 1, Item 11) securing roller shaft (Figure 1, Item 9) to gooseneck weldment bracket (Figure 1, Item 12). Discard locknut.

WARNING

The roller assemblies are heavy. Use extreme caution when handling roller assemblies or injury to personnel may result.

4. Remove roller shaft (Figure 1, Item 9) from roller assembly (Figure 1, Item 7) through bracket (Figure 1, Item 12).
5. Remove two capscrews (Figure 1, Item 1), lockwashers (Figure 1, Item 2), and plate clamp (Figure 1, Item 3). Remove roller assembly (Figure 1, Item 15) from roller shaft (Figure 1, Item 14). Discard lockwashers.
6. Remove two capscrews (Figure 1, Item 1), lockwashers (Figure 1, Item 2), and plate clamp (Figure 1, Item 5). Remove roller assembly (Figure 1, Item 6) from roller shaft (Figure 1, Item 13). Discard lockwashers.



HETT0459

Figure 1. Cable Guide Removal.

END OF TASK

REPAIR

1. Remove two bearings (Figure 2, Item 1) from roller assembly (Figure 2, Item 4).
2. Remove two bearings (Figure 2, Item 1) from each roller assembly (Figure 2, Item 2 and Item 3).

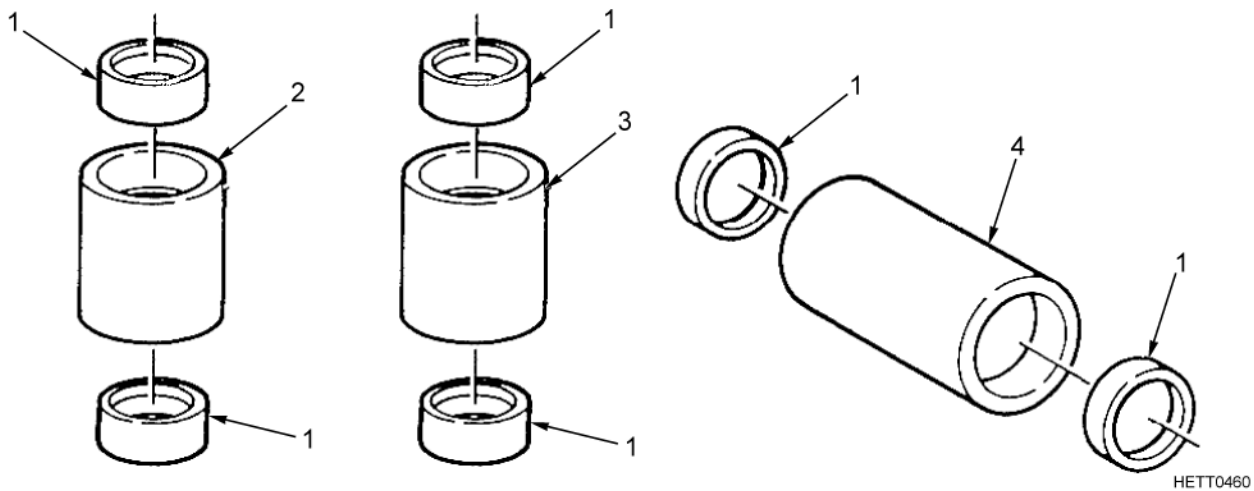


Figure 2. Bearing Removal.

WARNING

Cleaning compound solvent is used to clean parts and is potentially dangerous to personnel. Extinguish all smoking materials and do not allow sparks or open flame near the work area. Use skin and eye protection and work in a well-ventilated area. Failure to follow this warning may result in injury to personnel

3. Clean all parts removed in degreaser tank with cleaning compound solvent and wire brush as necessary. Remove corrosion using wire brush and crocus cloth.

4. Inspect rollers and roller shafts for surface deterioration, scratches, scoring, pitting, burrs, or gouging that could interfere with mounting or mating components or bearings.
5. Inspect bracket weldments for broken welds, cracks, evidence of warping, and peeling of paint.
6. Check sleeve bearings for surface defects, indications that bearing may be rotating about shaft, evidence of overheating, and signs of improper lubrication.
7. Check condition of plate clamps and all attaching hardware. Replace any defective or missing components and hardware.
8. Lubricate six bearings (Figure 3, Item 1) with grease before assembly.

NOTE

When bearing is seated correctly, approximately 0.25 in. (6.4 mm) of bearing will be exposed from end of roller assembly.

9. Install two bearings (Figure 3, Item 1) in each roller assembly (Figure 3, Item 2 and Item 3).
10. Install two bearings (Figure 3, Item 1) in roller assembly (Figure 3, Item 4).

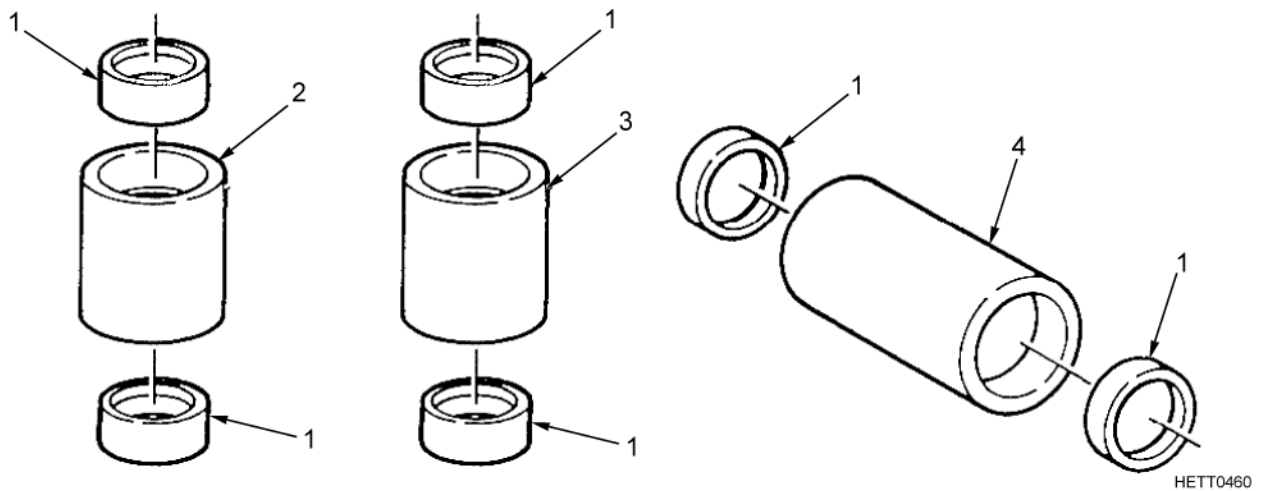


Figure 3. Bearing Installation.

END OF TASK

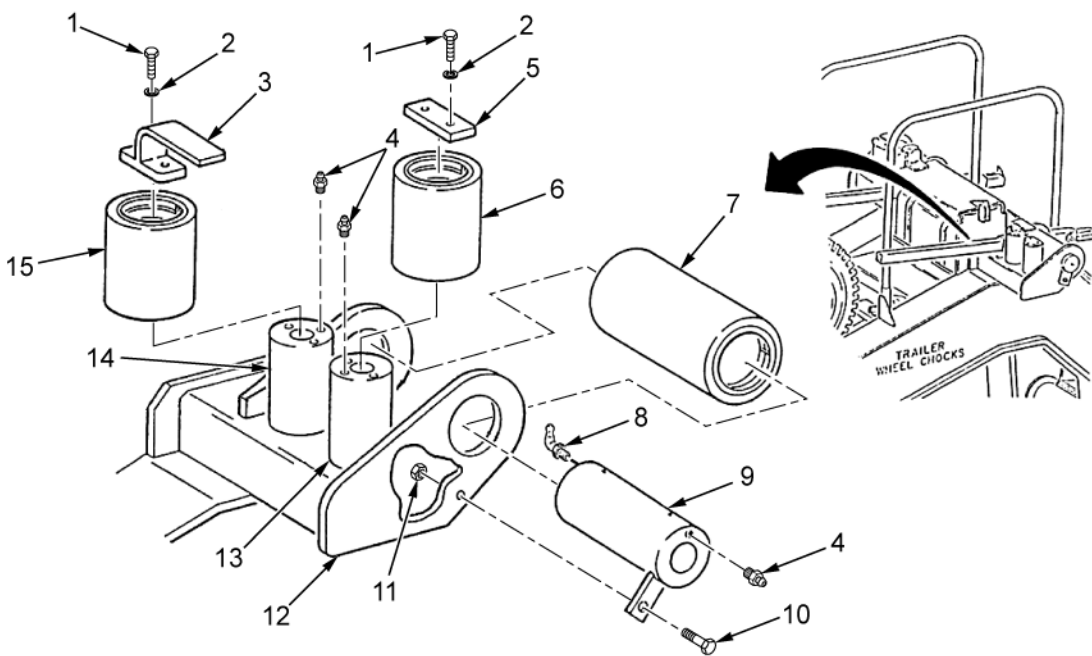
INSTALLATION

WARNING



.....**The roller assemblies are heavy. Use extreme caution when handling roller assemblies or injury to personnel may result.**

1. Install roller assembly (Figure 4, Item 15) onto roller shaft (Figure 4, Item 14) and install clamp plate (Figure 4, Item 3), two lockwashers (Figure 4, Item 2), and capscrews (Figure 4, Item 1) onto roller shaft.
2. Install roller assembly (Figure 4, Item 6) onto roller shaft (Figure 4, Item 13) and install clamp plate (Figure 4, Item 5), two lockwashers (Figure 4, Item 2), and capscrews (Figure 4, Item 1) onto roller shaft.
3. Position roller assembly (Figure 4, Item 7) in gooseneck weldment bracket (Figure 4, Item 12) and install roller shaft (Figure 4, Item 9). Secure roller shaft to gooseneck weldment bracket with capscrew (Figure 4, Item 10) and locknut (Figure 4, Item 11).
4. Install grease fittings (Figure 4, Item 4 and Item 8) on all three roller shafts (Figure 4, Item 9, Item 13, and Item 14).



HETT0459

Figure 4. Cable Guide Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Lubricate cable guides (WP 0163).

END OF WORK PACKAGE

FIELD MAINTENANCE

REFLECTORS

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (WP 0168, Item 11)

Personnel Required

1

Materials/Parts

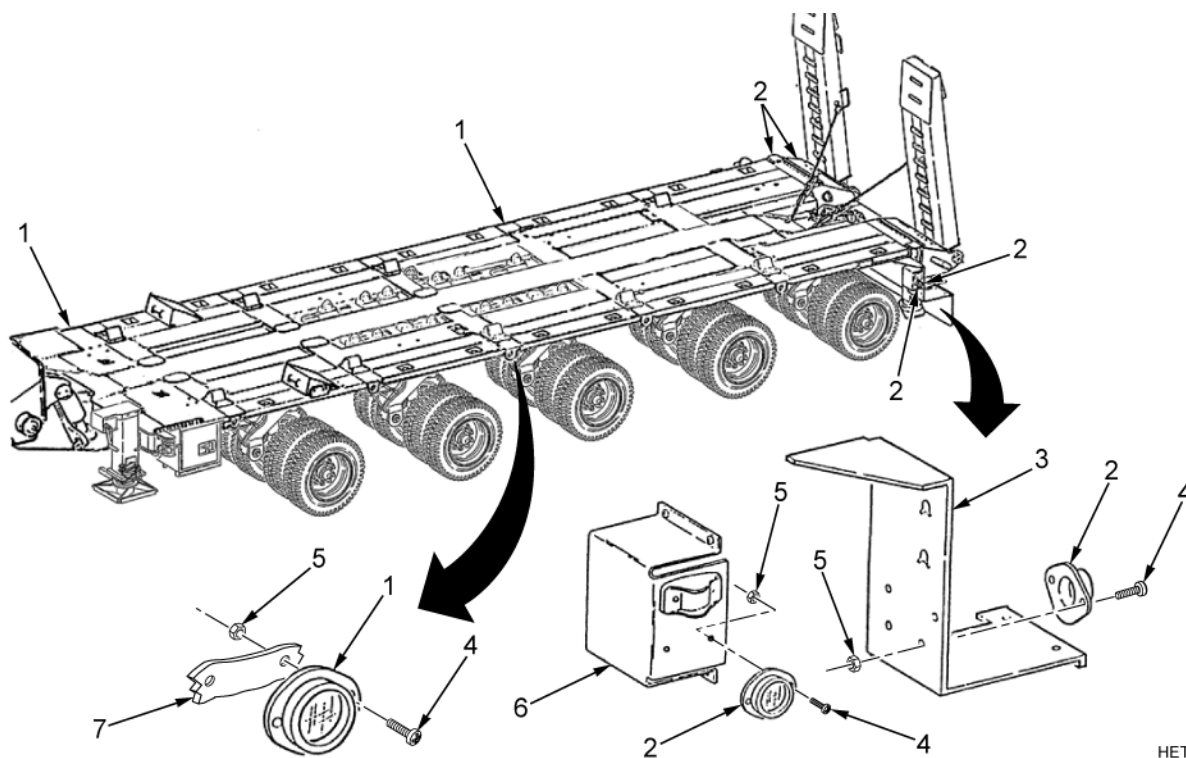
Locknut (16)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the reflectors.

REMOVAL

1. To remove any one of four amber reflectors (Figure 1, Item 1), remove two locknuts (Figure 1, Item 5), screws (Figure 1, Item 4), and reflector from platform weldment (Figure 1, Item 7). Discard locknuts.
2. To remove either of two red reflectors (Figure 1, Item 2) located at rear of platform on streetside or curbside deflectors (Figure 1, Item 3), remove two locknuts (Figure 1, Item 5), screws (Figure 1, Item 4), and reflector from deflector. Discard locknuts.
3. To remove either curbside or streetside rear red reflectors (Figure 1, Item 2), remove access cover (Figure 1, Item 6) from deflector (Figure 1, Item 3) (WP 0099). Remove two locknuts (Figure 1, Item 5), screws (Figure 1, Item 4), and reflectors from access cover. Discard locknuts.



HETT0462

Figure 1. Reflector Removal.

END OF TASK

INSTALLATION

1. To install any one of four amber reflectors (Figure 2, Item 1), position reflector in appropriate location on platform weldment (Figure 2, Item 7), align mounting holes, and secure reflector with two screws (Figure 2, Item 4) and new locknuts (Figure 2, Item 5).
2. To install either of two red reflectors (Figure 2, Item 2) located at rear of platform on streetside or curbside deflectors (Figure 2, Item 3), position reflector on deflector, align mounting holes, and secure reflector with two screws (Figure 2, Item 4) and new locknuts (Figure 2, Item 5).
3. To install either curbside or streetside rear red reflector assemblies (Figure 2, Item 2), position reflector on access cover (Figure 2, Item 6), align mounting holes, and secure with two screws (Figure 2, Item 4) and new locknuts (Figure 2, Item 5). Assemble access cover to deflector (Figure 2, Item 3) (WP 0099).

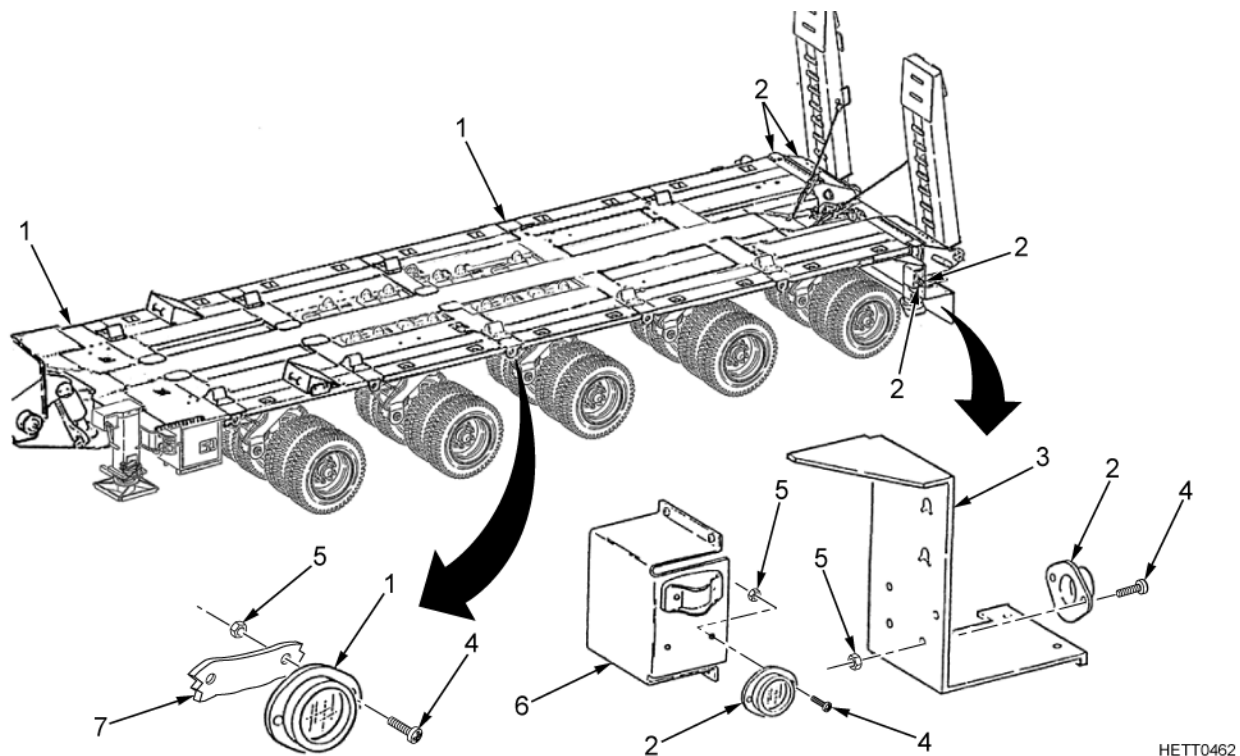


Figure 2. Reflector Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**DATA PLATES, DECALS, AND STENCILS**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Kit (WP 0168, Item 28)

Locknut (4)
Locknut (4)
Locknut (10)
Locknut (4)
Washer (1)

Materials/Parts

Alcohol, Technical (WP 0170, Item 1)
Rag, Wiping (WP 0170, Item 23)
Solvent, Dry Cleaning (WP 0170, Item 32)
Tape, Double-Sided (WP 0170, Item 34)
Rivet (4)
Rivet (4)
Rivet (4)
Rivet (5)
Rivet (2)
Locknut (2)

Personnel Required

1

Equipment Conditions

Tractor/semitrailer uncoupled (WP 0013)
Gooseneck lowered to lowest position, if uncoupled (WP 0007)
Platform adjusted to 43 in. height (109 cm) (WP 0008)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the data plates, decals, and stencils for the HET semitrailer.

REMOVAL

WARNING**SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
- The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound.
- Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.
- Compressed air used for cleaning/drying may create airborne particles that may injure the eyes. Always wear eye protection. Pressure must not exceed 30 psi (207 kPa).
- Drilling operations are hazardous to the eyes, always wear eye protection when drilling.

Failure to follow these warnings may result in injury or death to personnel.

1. To remove decal (Figure 1, Item 2), use 5/32 in. drill and drill out four rivets (Figure 1, Item 1) and remove decal.
2. To remove decal (Figure 1, Item 4), use 5/32 in. drill and drill out four rivets (Figure 1, Item 3) and remove decal.
3. To remove decal (Figure 1, Item 5), use 5/32 in. drill and drill out four rivets (Figure 1, Item 6). Remove four washers (Figure 1, Item 7) and decal.
4. To remove decal (Figure 1, Item 10), use 5/32 in. drill and drill out four rivets (Figure 1, Item 8). Remove four washers (Figure 1, Item 9) and decal.
5. To remove identification marker (Figure 1, Item 13), use 5/32 in. drill and drill out four rivets (Figure 1, Item 11). Remove four washers (Figure 1, Item 12) and marker.

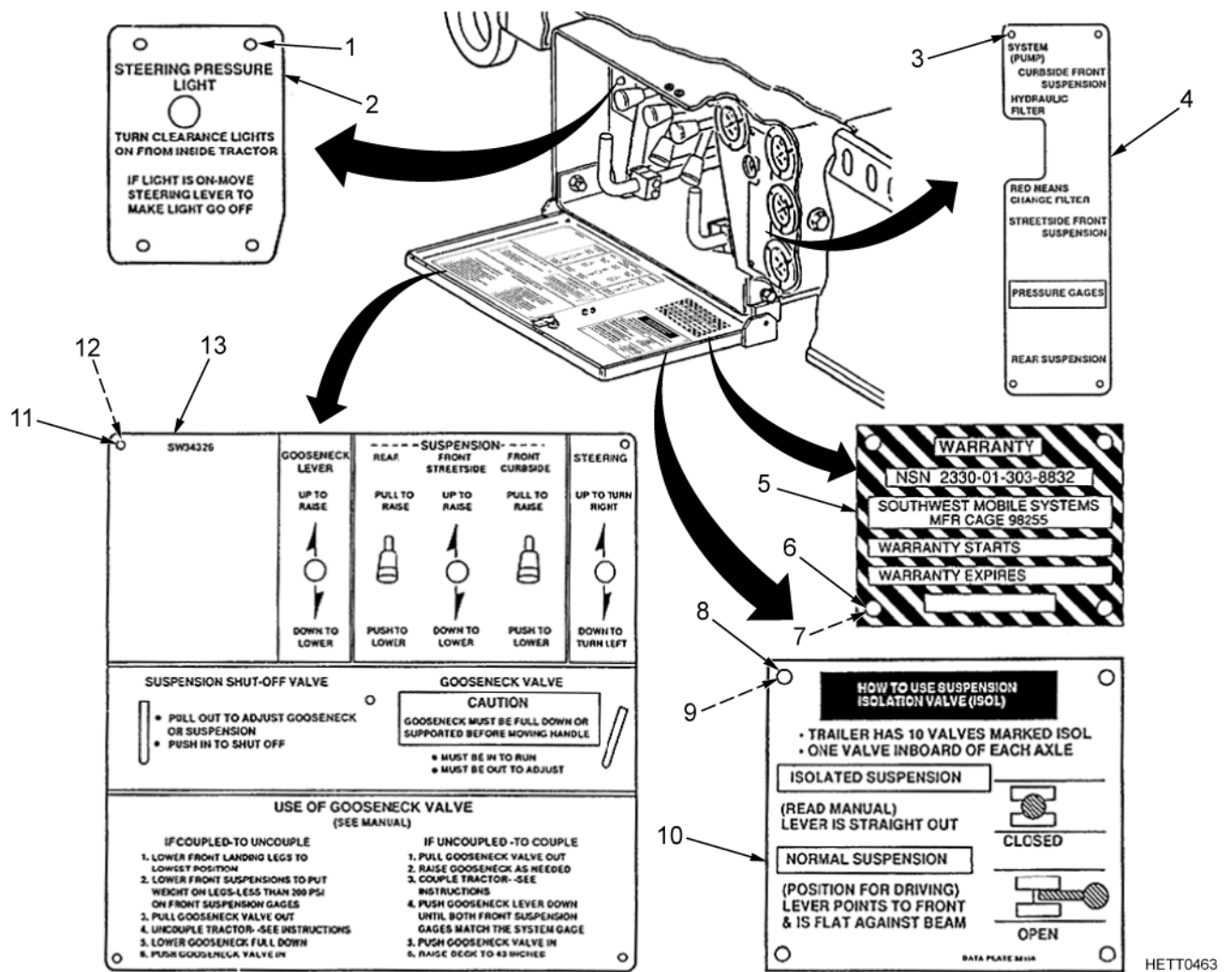
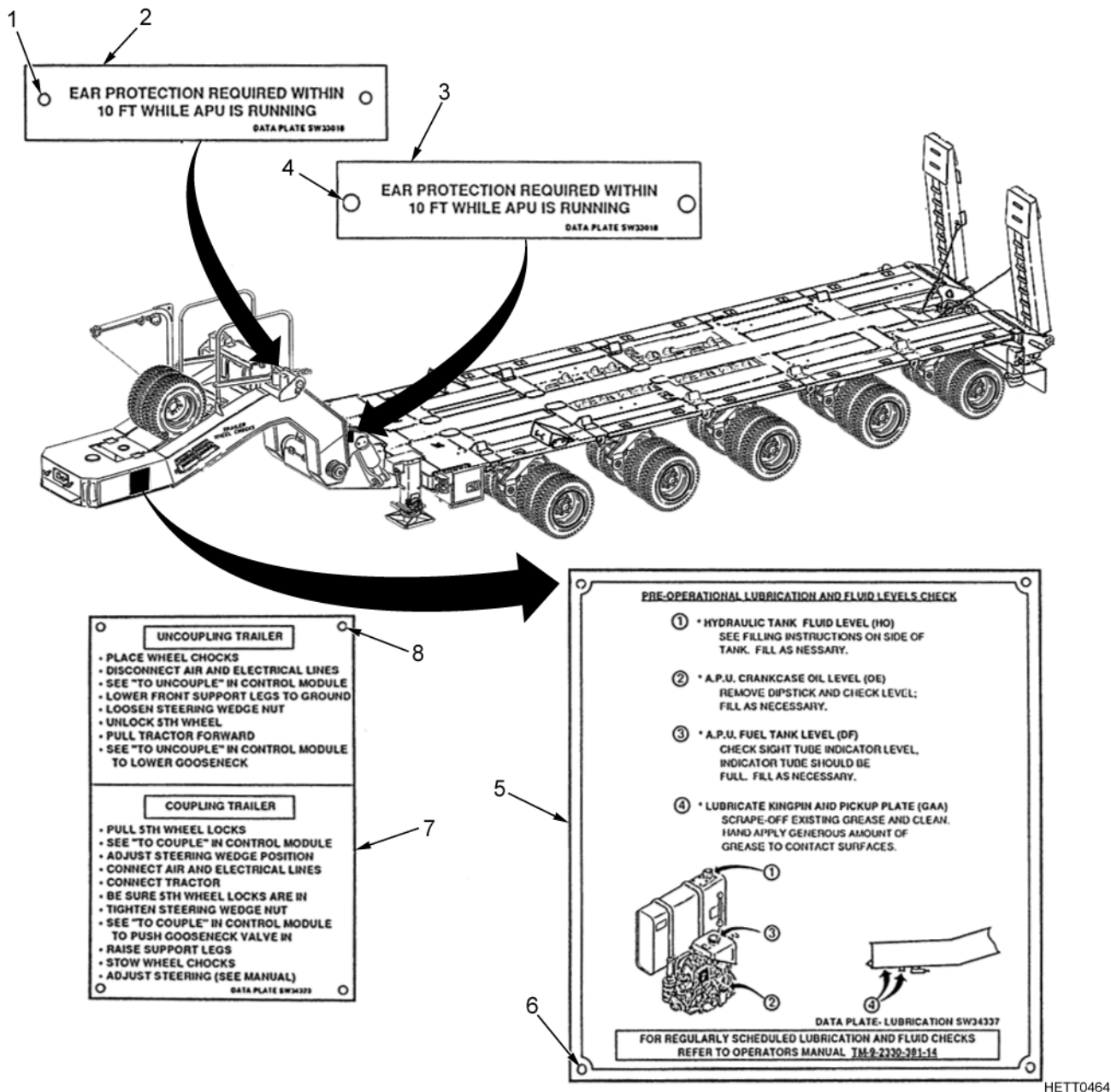


Figure 1. Data Plates, Decals, and Stencils Removal.

HETT0463

6. To remove identification plate (Figure 2, Item 2), use 3/16 in. drill and drill out two rivets (Figure 2, Item 1) and remove plate.
7. To remove identification plate (Figure 2, Item 3), remove two locknuts (Figure 2, Item 4) and remove plate. Discard locknuts.
8. To remove decal (Figure 2, Item 5), remove four locknuts (Figure 2, Item 6) and remove decal. Discard locknuts.
9. To remove identification plate (Figure 2, Item 7), remove four locknuts (Figure 2, Item 8) and remove plate. Discard locknuts.



HETT0464

Figure 2. Data Plates, Decals, and Stencils Removal.

10. To remove any of five identification markers (Figure 3, Item 4), remove two locknuts (Figure 3, Item 5) and remove marker. Discard locknuts.
11. To remove decal (Figure 3, Item 1 or Item 3), use 5/32 in. drill and drill out four rivets (Figure 3, Item 2) and remove decal.

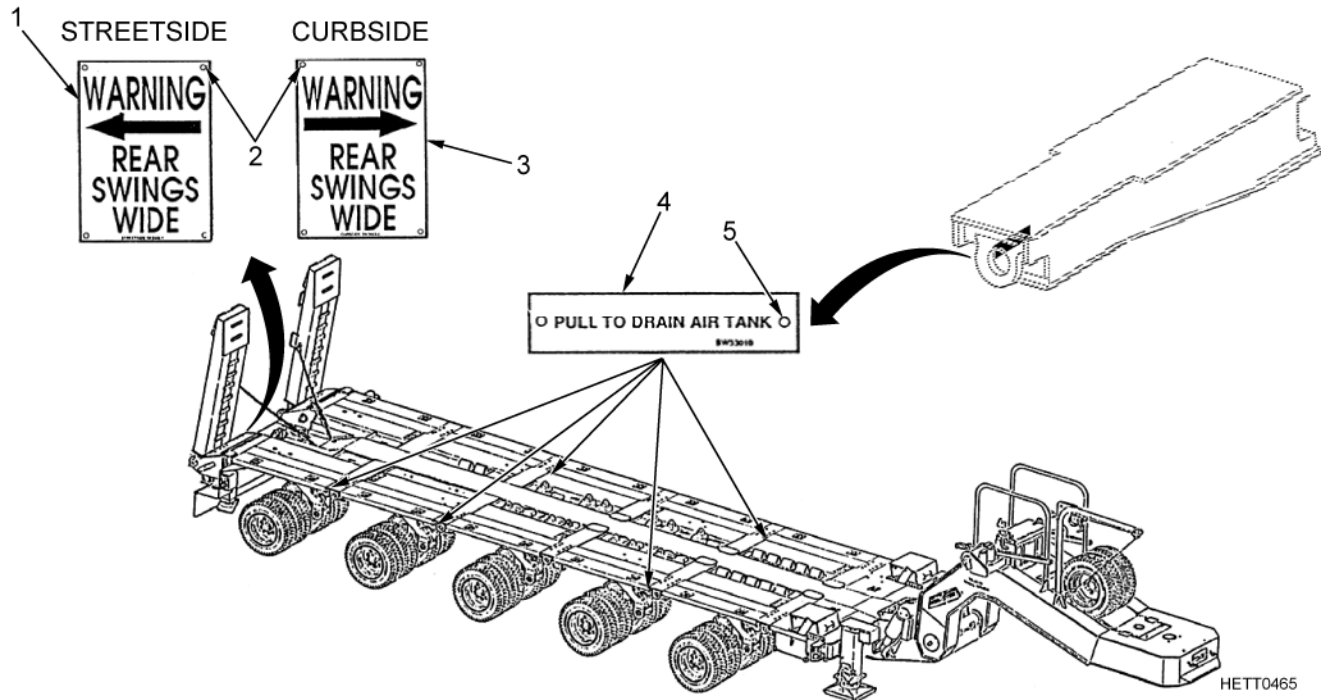
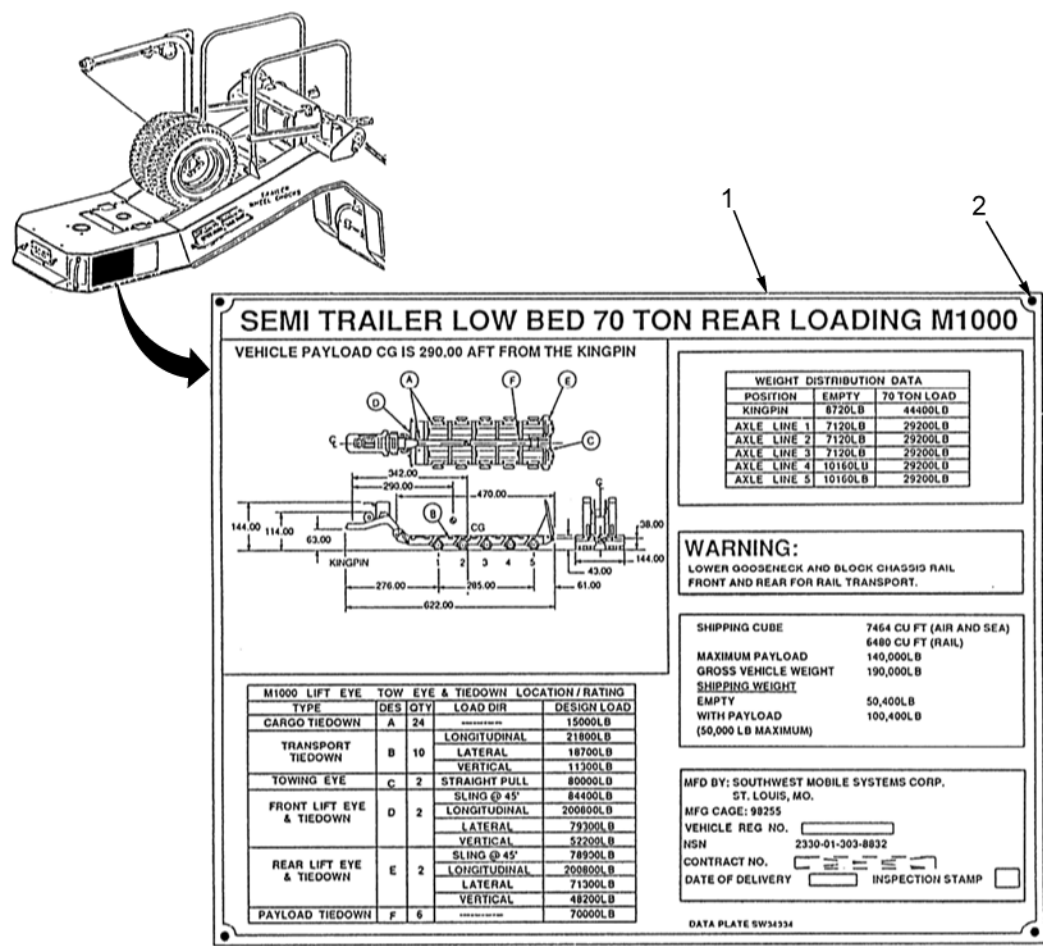


Figure 3. Data Plates, Decals, and Stencils Removal.

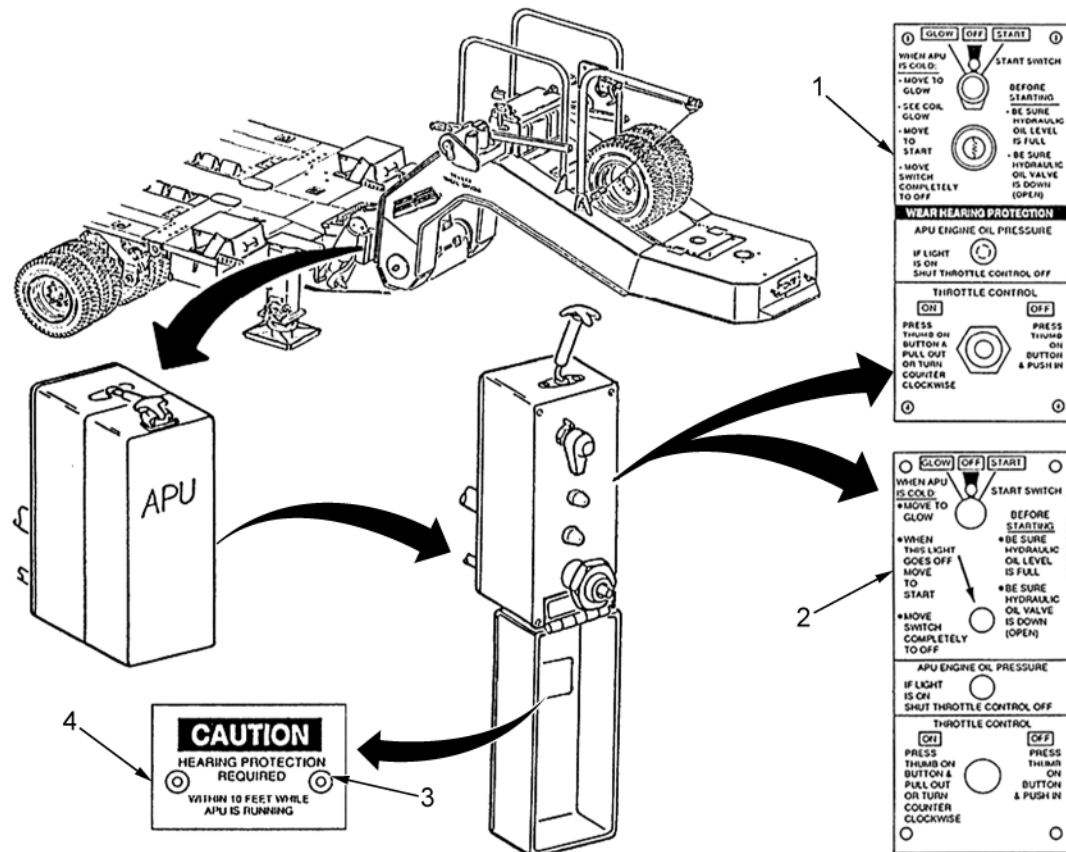
12. To remove identification plate (Figure 4, Item 1), remove four locknuts (Figure 4, Item 2) and remove plate. Discard locknuts.



HETT0466

Figure 4. Data Plates, Decals, and Stencils Removal.

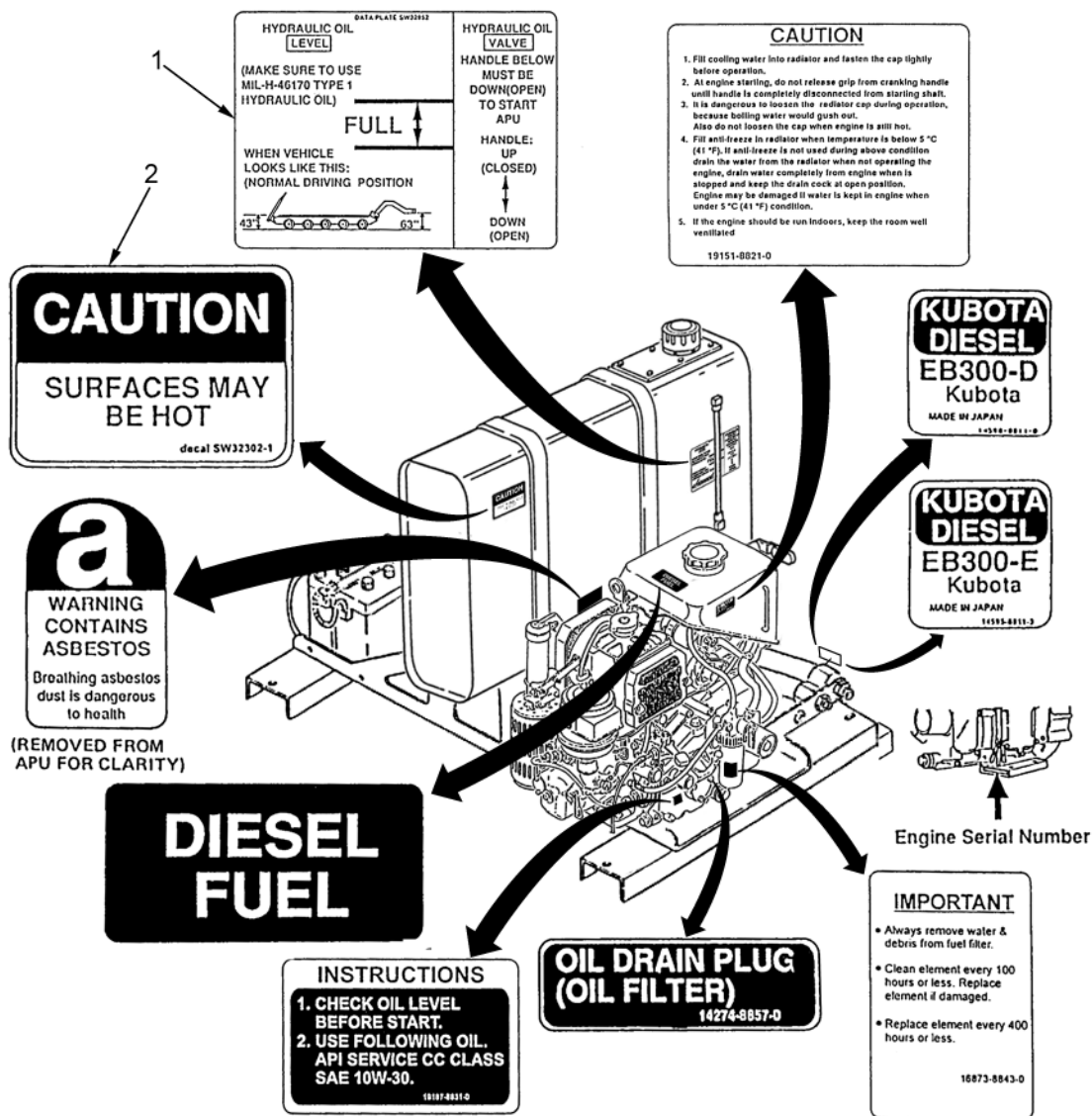
13. Decal (Figure 5, Item 1 or Item 2) is removed during disassembly of APU control box (WP 0137).
14. To remove decal (Figure 5, Item 4), use 5/32 in. drill and drill out two rivets (Figure 5, Item 3) and remove decal.



HETT0467

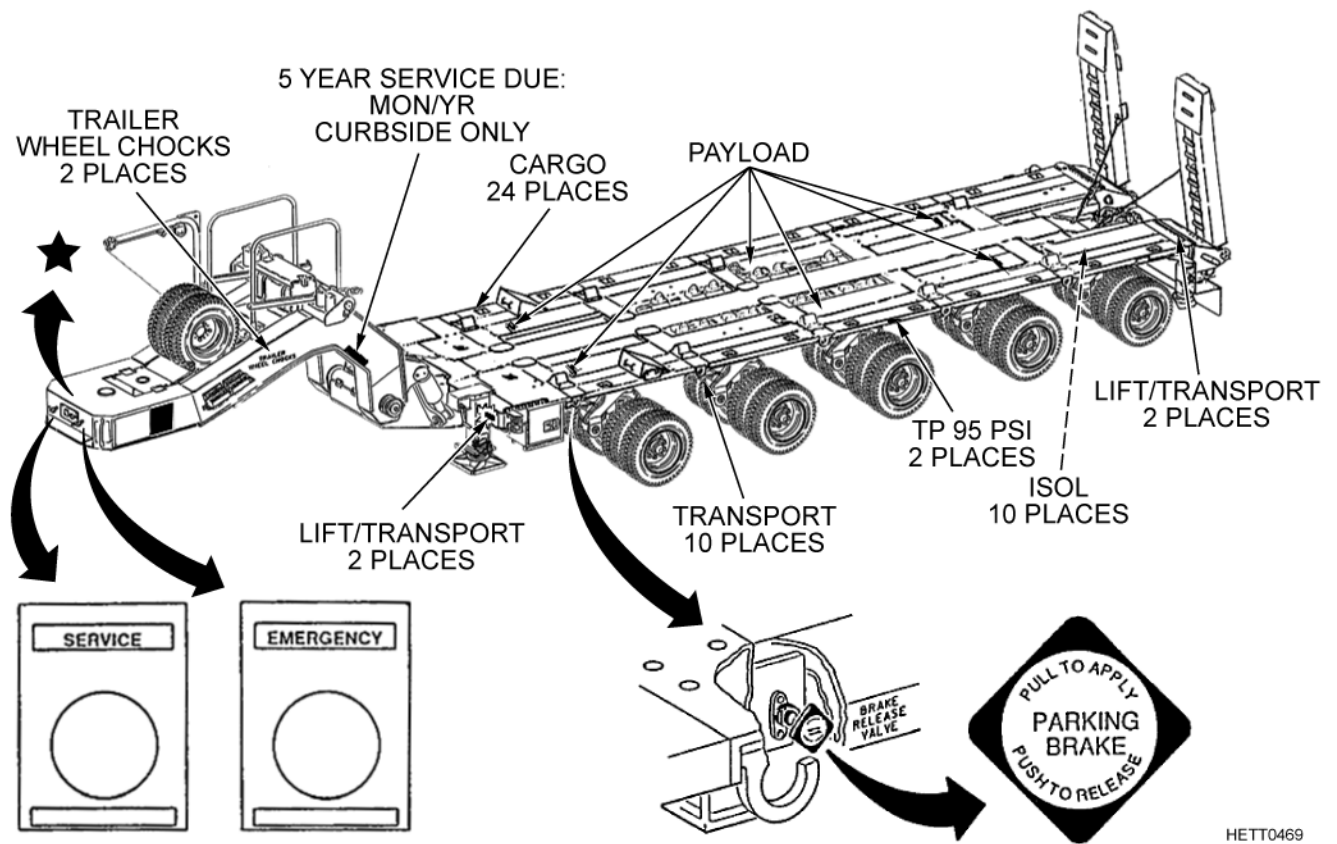
Figure 5. Data Plates, Decals, and Stencils Removal.

15. Use scraper to carefully scrape decals and stencils as required. Decals (Figure 6, Item 1 and Item 2) are installed with double-sided tape. Ensure that tape residue is removed completely.



HETT0468

Figure 6. Data Plates, Decals, and Stencils Removal.



HETT0469

Figure 7. Data Plates, Decals, and Stencils Removal.

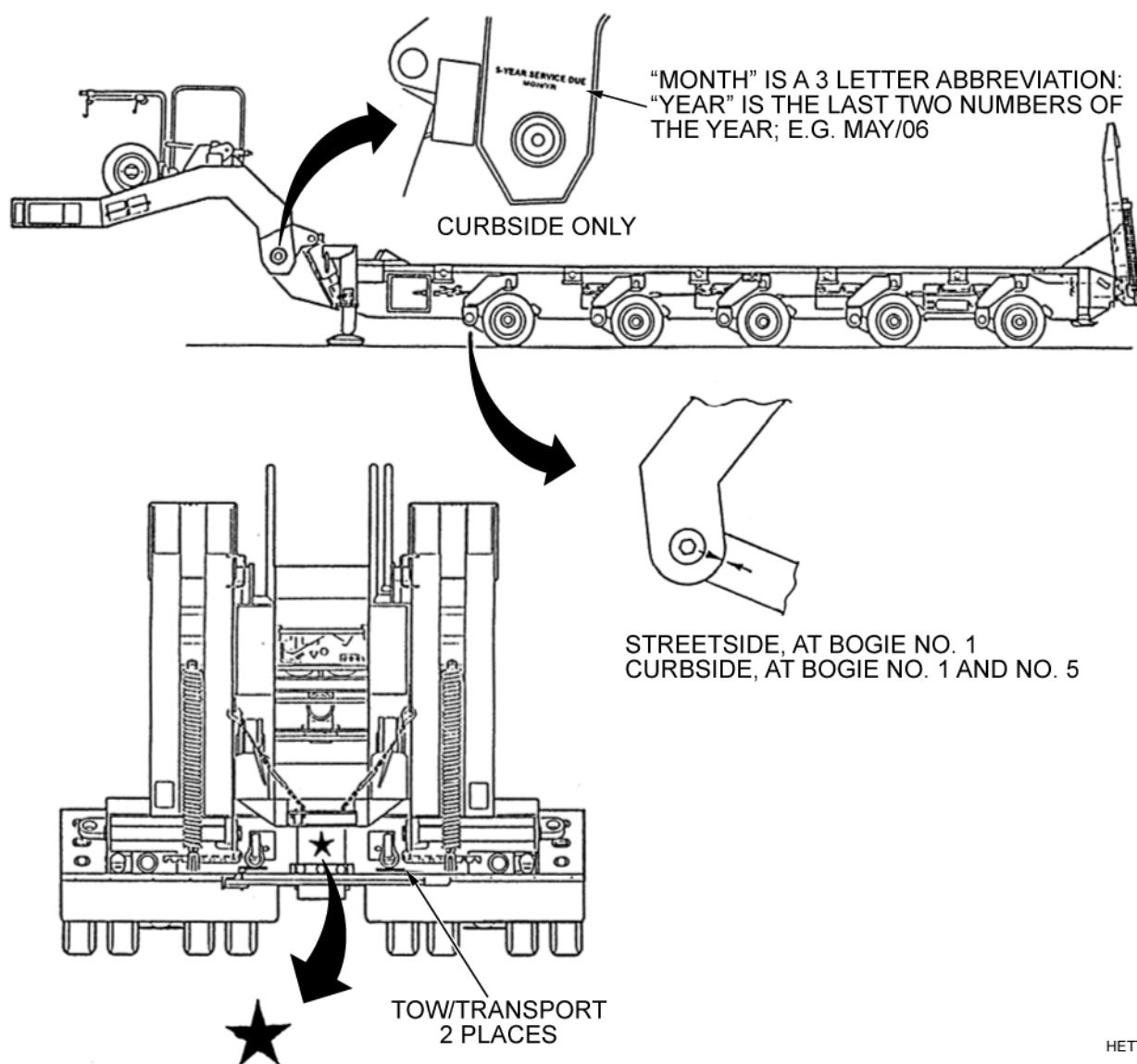


Figure 8. Data Plates, Decals, and Stencils Removal.

16. Clean surfaces with alcohol to remove glue and residue.

WARNING



SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
- The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound.
- Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.
- Compressed air used for cleaning/drying may create airborne particles that may injure the eyes. Always wear eye protection. Pressure must not exceed 30 psi (207 kPa).

Failure to follow these warnings may result in injury or death to personnel.

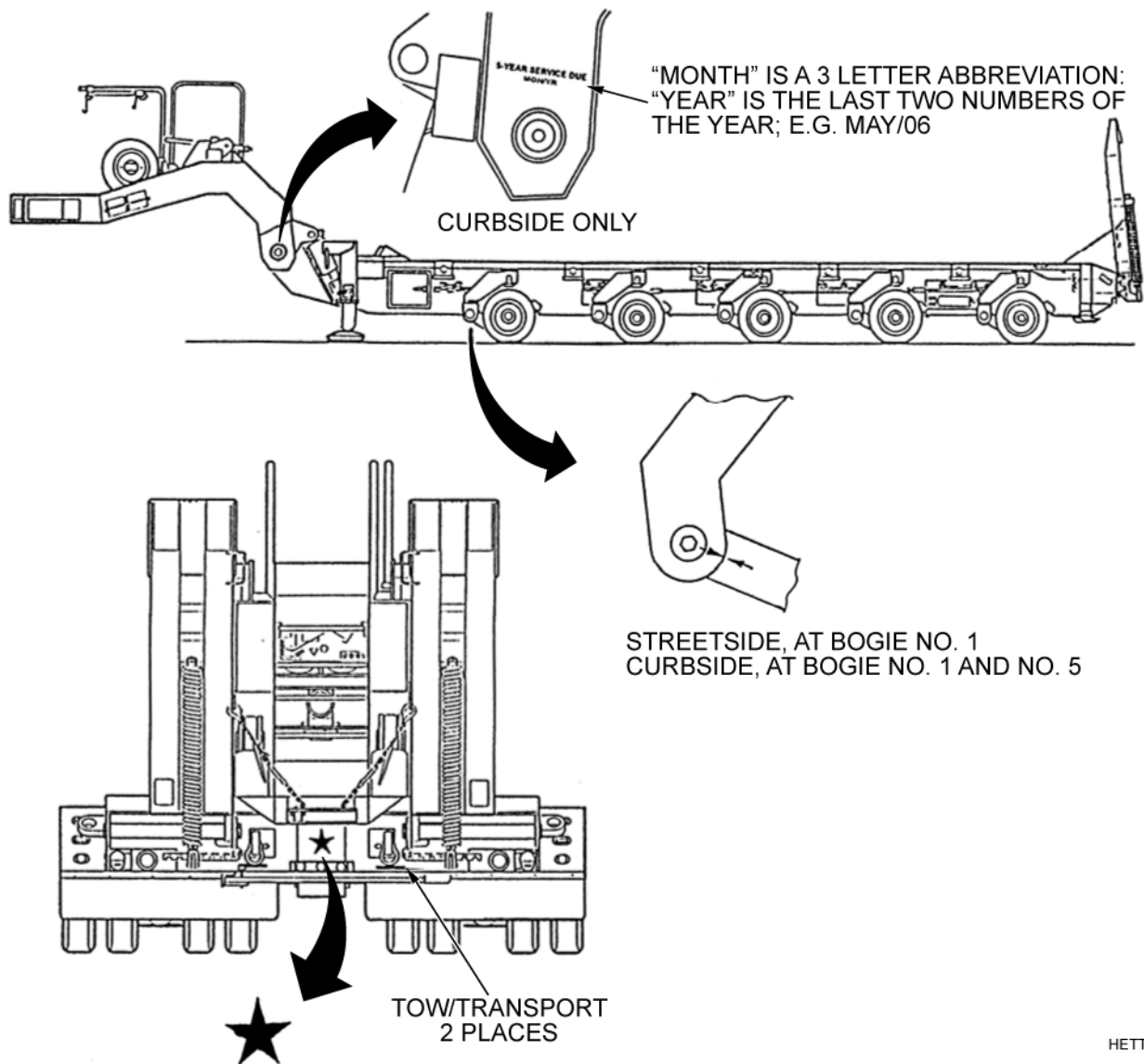
17. Use dry cleaning solvent to clean corrosion from all surfaces on which stencil, decal, or data plate will be installed.

18. Touch up all bare surfaces with primer paint.

END OF TASK

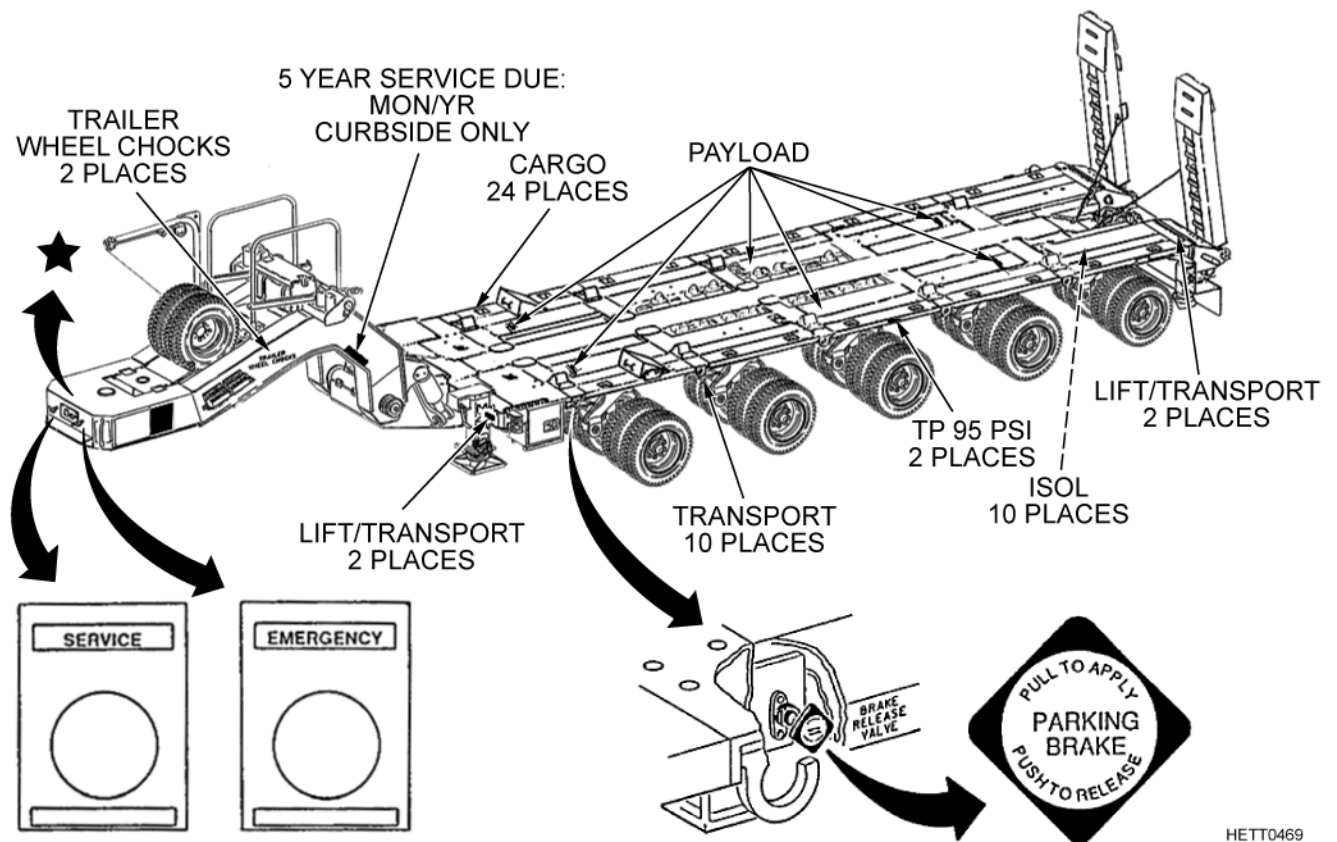
INSTALLATION

1. Use stencil set and paint to apply or touch up stencils as necessary.
2. Install decals to trailer as required.



HETT0470

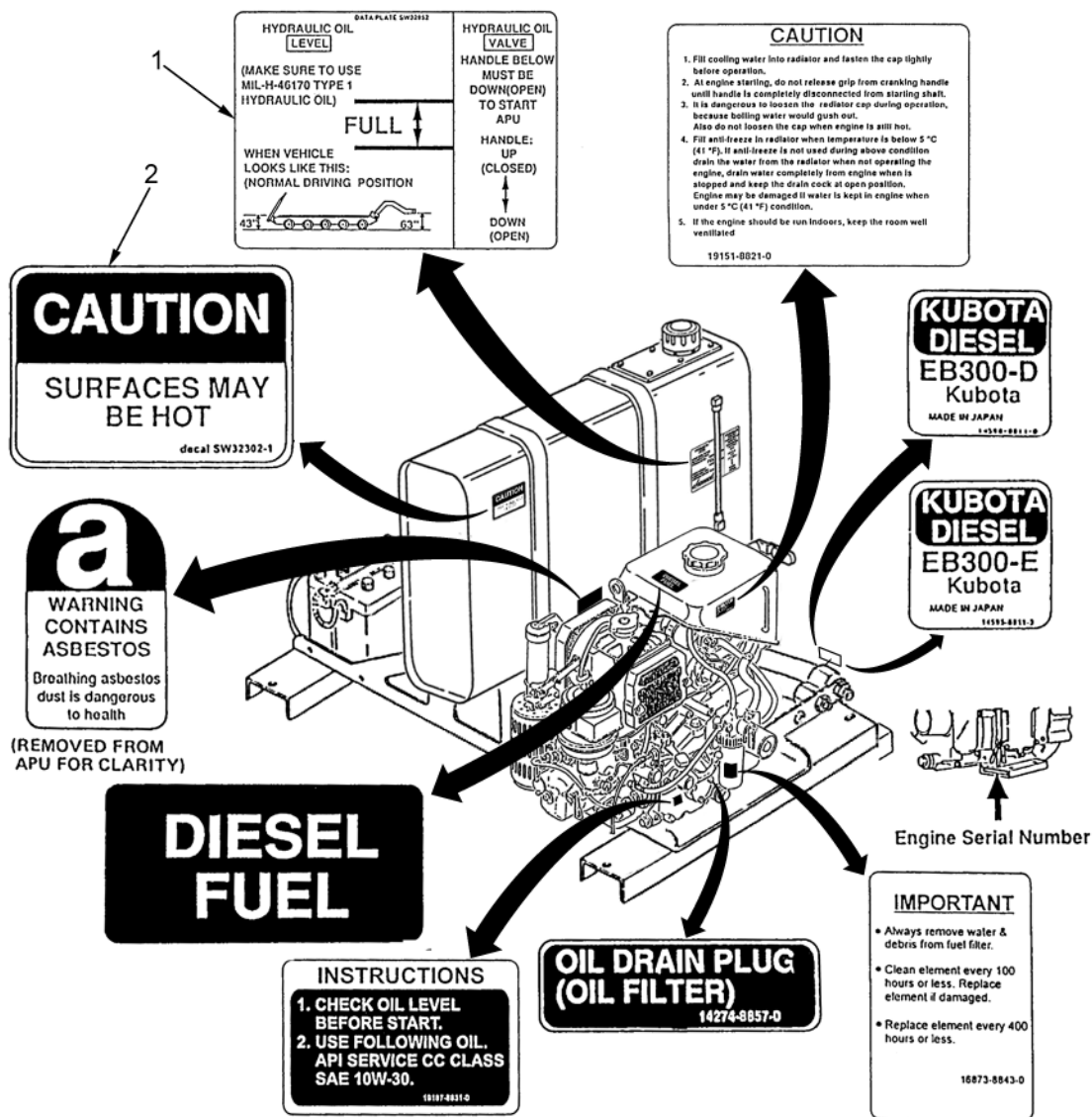
Figure 9. Data Plates, Decals, and Stencils Installation.



HETT0469

Figure 10. Data Plates, Decals, and Stencils Installation.

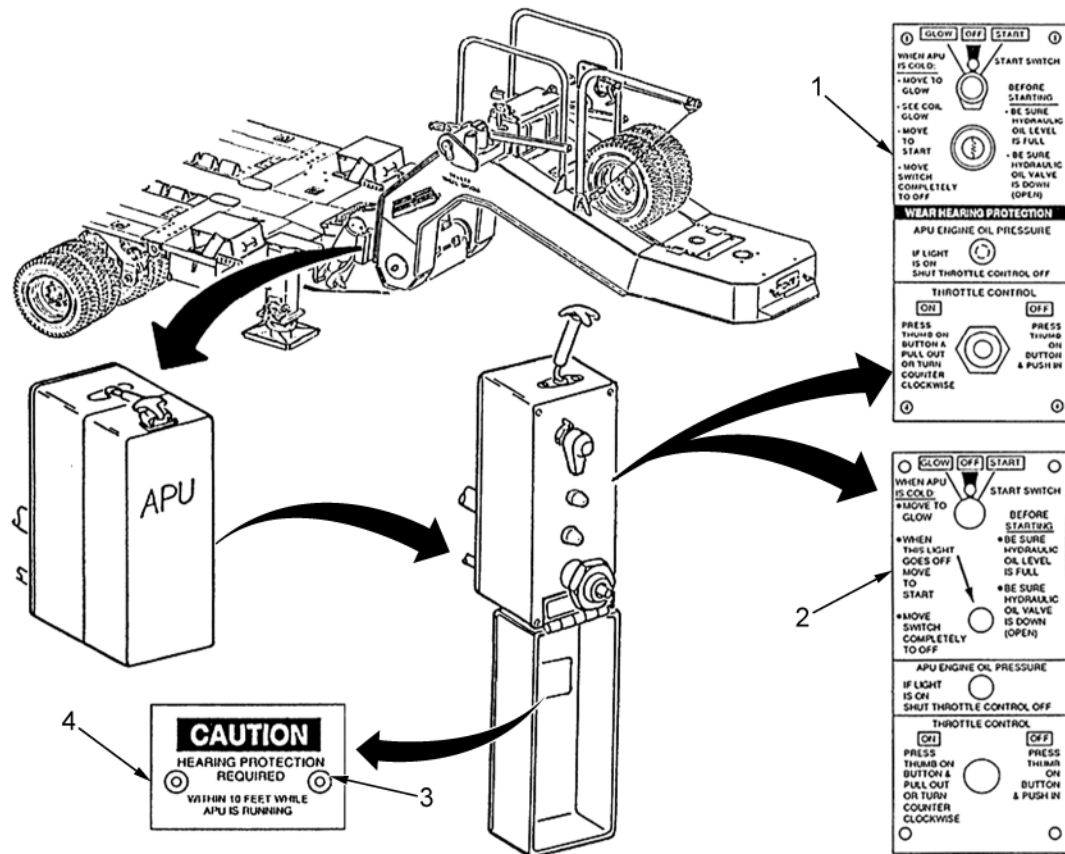
3. Install decals (Figure 11, Item 1 and Item 2) using double-sided tape.
4. Clean data plate with alcohol and apply black paint to areas on data plate to be stenciled. Use stencil set to apply markings as required to data plate.



HETT0468

Figure 11. Data Plates, Decals, and Stencils Installation.

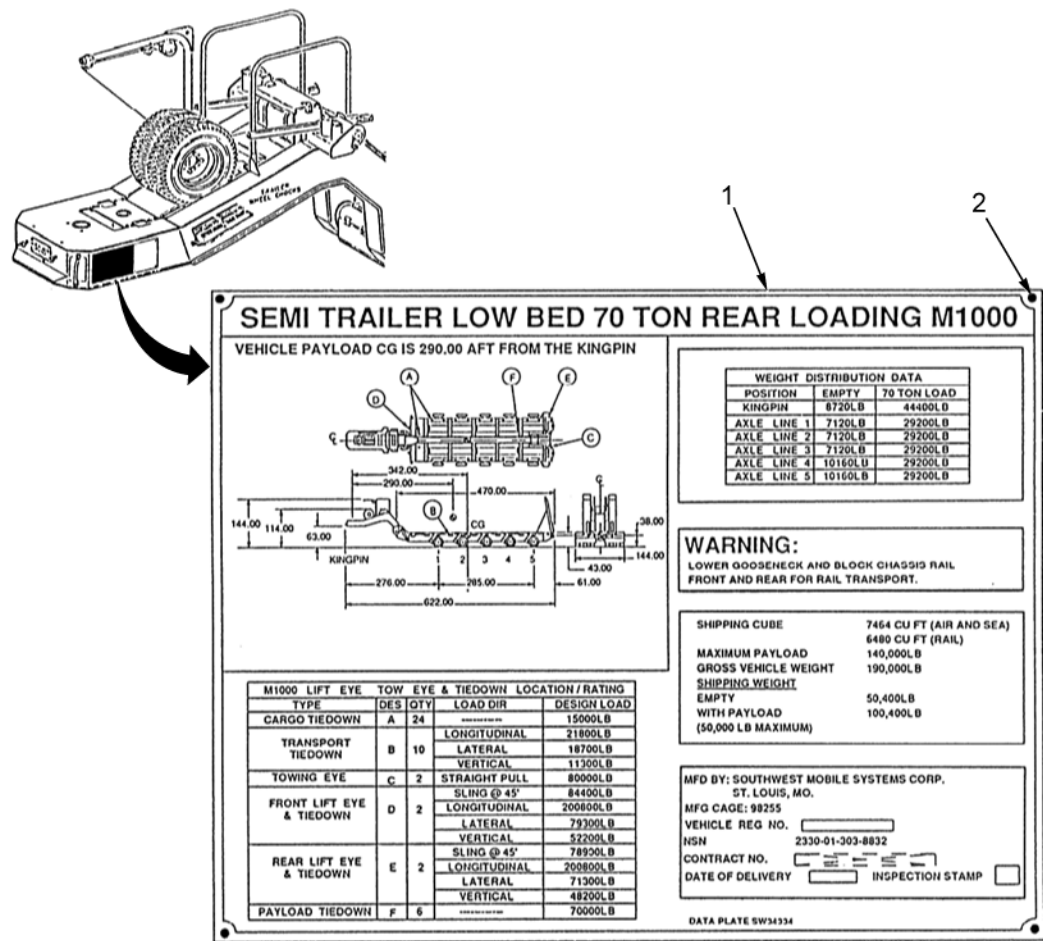
5. To install decal (Figure 12, Item 1 or Item 2), refer to WP 0137.
6. To install decal (Figure 12, Item 4), position in APU control box cover and, using hand riveter, secure with two rivets (Figure 12, Item 3).



HETT0467

Figure 12. Data Plates, Decals, and Stencils Installation.

7. To install identification plate (Figure 13, Item 1), position plate on used weld studs and secure with four locknuts (Figure 13, Item 2).



HETT0466

Figure 13. Data Plates, Decals, and Stencils Installation.

8. To install decal (Figure 14, Item 1 or Item 3), position decal on ramp and, using hand riveter, secure with four rivets (Figure 14, Item 2).
9. To install any of five identification markers (Figure 14, Item 4), position marker on weld studs and secure with two locknuts (Figure 14, Item 5).

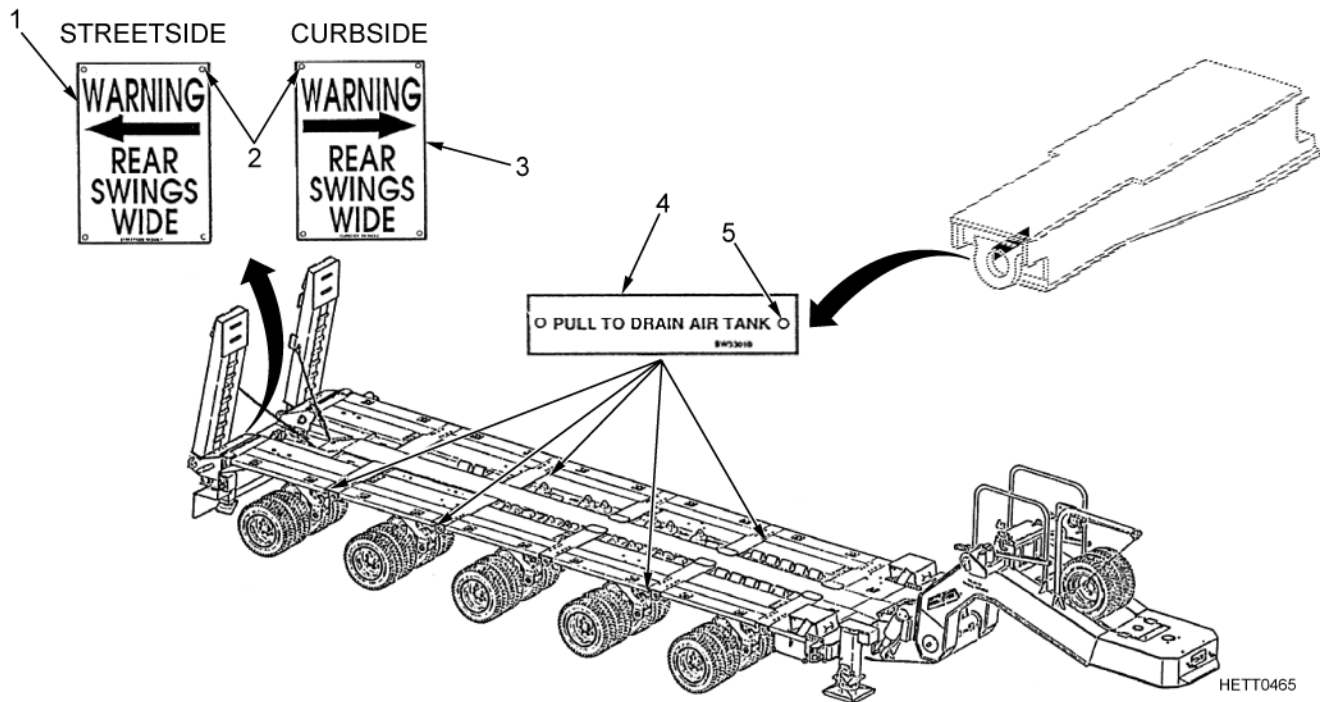
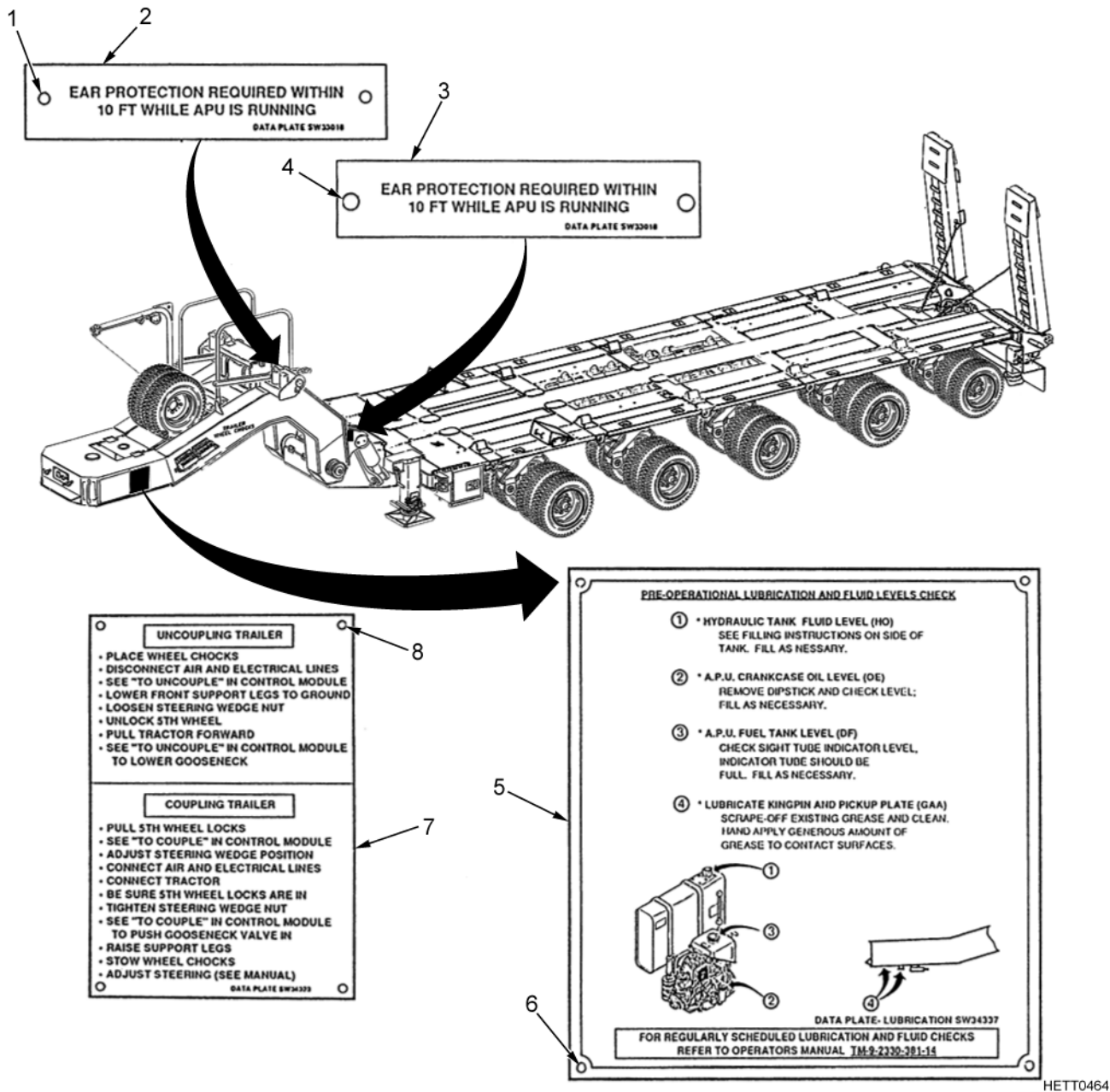


Figure 14. Data Plates, Decals, and Stencils Installation.

10. To install identification plate (Figure 15, Item 7), position plate on weld studs and secure with four locknuts (Figure 15, Item 8).
11. To install decal (Figure 15, Item 5), position decal on weld studs and secure with four locknuts (Figure 15, Item 6).
12. To install identification plate (Figure 15, Item 3), position plate on weld studs and secure with two locknuts (Figure 15, Item 4).
13. To install identification plate (Figure 15, Item 2), position plate on gooseneck and, using hand riveter, secure with two rivets (Figure 15, Item 1).



HETT0464

Figure 15. Data Plates, Decals, and Stencils Installation.

14. To install identification marker (Figure 16, Item 13), position marker on inside of hydraulic control module access cover and, using hand riveter, secure with four washers (Figure 16, Item 12) and four rivets (Figure 16, Item 11).
15. To install decal (Figure 16, Item 10), position decal on inside of hydraulic control module access cover and, using hand riveter, secure with four washers (Figure 16, Item 9) and four rivets (Figure 16, Item 8).
16. To install decal (Figure 16, Item 4), position decal inside hydraulic control module and, using hand riveter, secure with four rivets (Figure 16, Item 3).
17. To install decal (Figure 16, Item 5), position decal on inside of hydraulic control module and, using hand riveter, secure with four washers (Figure 16, Item 7) and rivets (Figure 16, Item 6).
18. To install decal (Figure 16, Item 2), position decal inside hydraulic control module and, using hand riveter, secure with four rivets (Figure 16, Item 1).

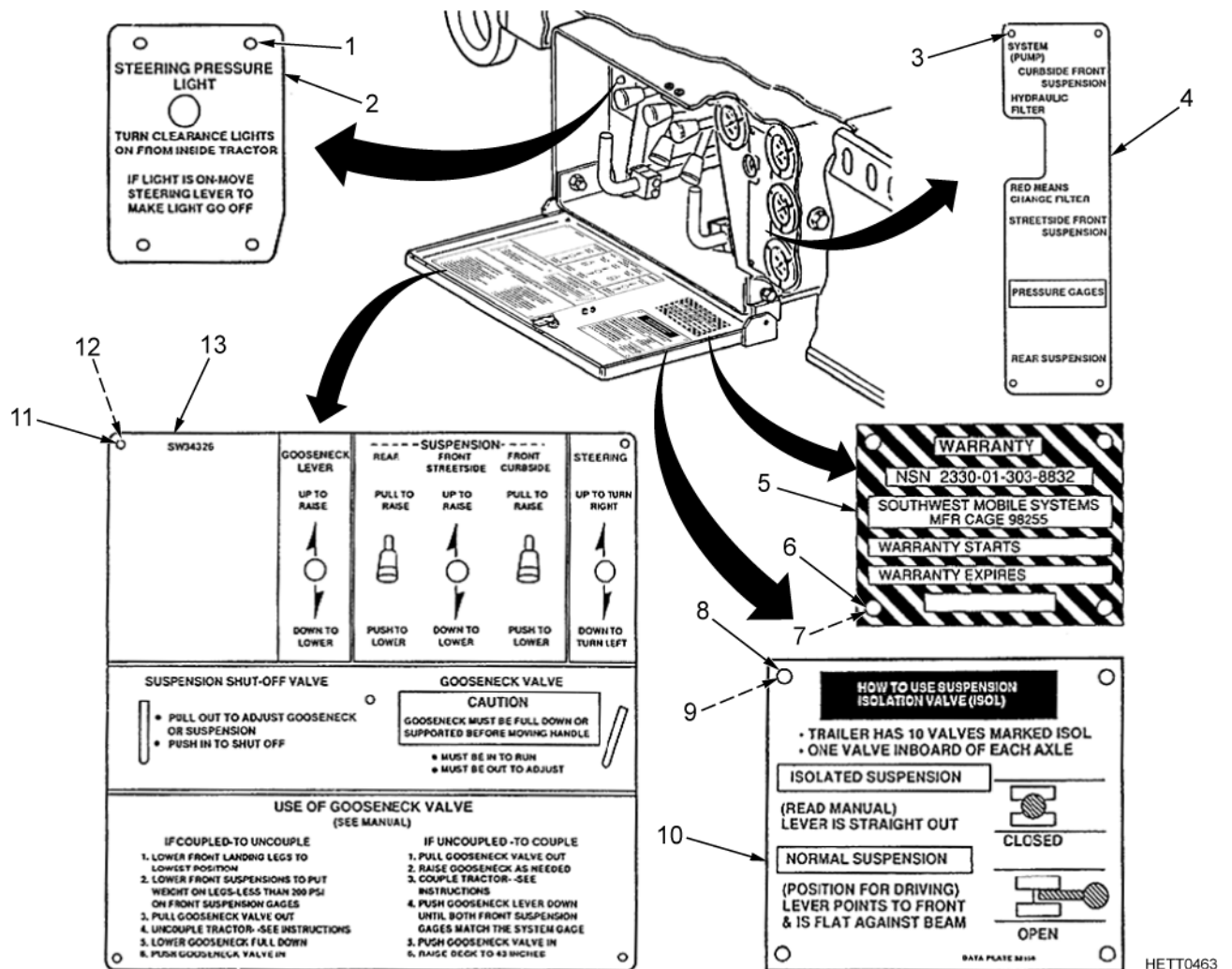


Figure 16. Data Plates, Decals, and Stencils Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**HYDRAULIC PUMP**

INITIAL SETUP:**Tools and Special Tools**

Standard Army Tool Set (WP 0168, Item 28)

Personnel Required

1

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)

Petroleum Jelly (WP 0170, Item 21)

Preformed Packing (2)

Lockwasher (2)

Equipment Conditions

Gooseneck supported at 64 in. (162.6 cm) height, if uncoupled (WP 0007)

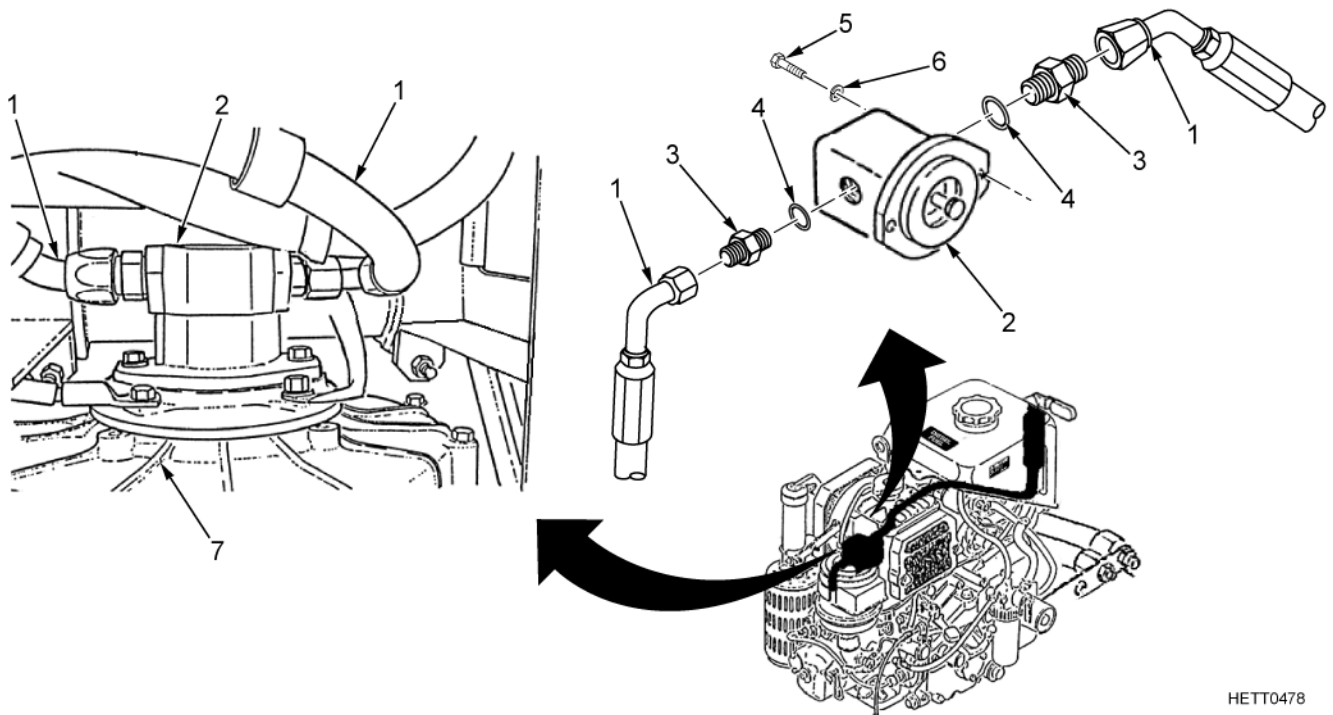
Battery negative (black) terminal disconnected from battery (WP 0053)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the hydraulic pump.

REMOVAL**WARNING**

- **Hydraulic fluid may be hot if system has been in operation. Allow time for system to cool before performing maintenance or injury to personnel may result.**
 - **Residual pressure may remain in hydraulic lines. Open fittings slowly or injury to personnel may result.**
 - **Hydraulic fluid may be absorbed through the skin. Avoid prolonged exposure to skin and wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into the eyes, flush them immediately with water and seek medical attention. If hydraulic fluid gets on skin, wash thoroughly with soap and water. Wash hands thoroughly prior to eating or smoking.**
1. Close hydraulic tank oil valve (WP 0004).
- CAUTION**
- **All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or foreign material from entering the hydraulic system or damage to equipment may result.**
 - **Both hydraulic lines must be capped immediately and secured at tank fluid level height or higher to prevent hydraulic fluid from siphoning from system.**
2. Use drain pan and a 1 1/4 in. combination wrench to tag and disconnect two hydraulic lines (Figure 1, Item 1) from hydraulic pump (Figure 1, Item 2). Install caps/plugs into hydraulic lines.
 3. Use rope or tiewraps to secure ends of both hydraulic lines (Figure 1, Item 1) at pump (Figure 1, Item 2) height or higher.
 4. Remove two capscrews (Figure 1, Item 5), lockwashers (Figure 1, Item 6), and hydraulic pump (Figure 1, Item 2) from Auxiliary Power Unit (APU) (Figure 1, Item 7). Discard lockwashers.
 5. Remove two straight pipe-to-tube adapters (Figure 1, Item 3) from pump (Figure 1, Item 2).
 6. Remove preformed packings (Figure 1, Item 4) from two straight pipe-to-tube adapters (Figure 1, Item 3). Install caps/plugs into openings and discard two preformed packings.
 7. Inspect hydraulic pump for cracked housing, bent rotor shaft, broken or marred spline on rotor shaft, or seal leaks in area of rotor shaft. Replace hydraulic pump if any defects are found.



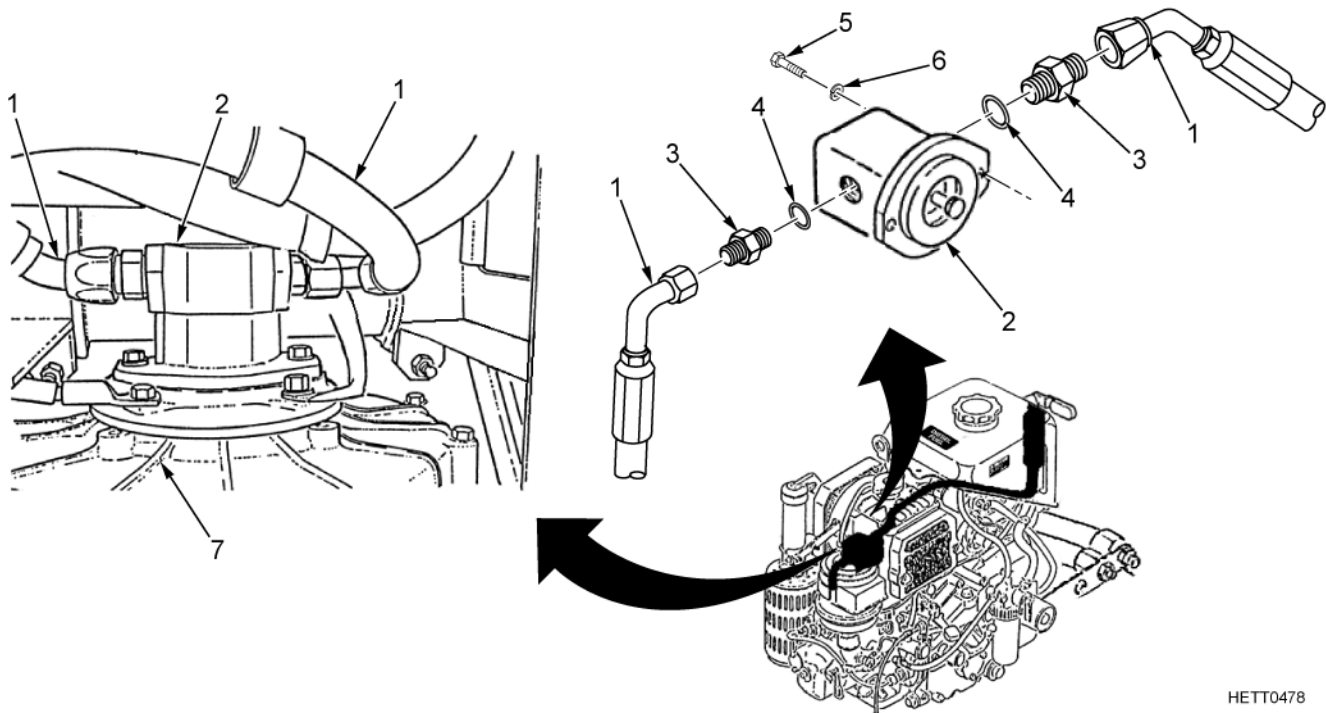
HETT0478

Figure 1. Hydraulic Pump Removal.

END OF TASK

INSTALLATION

1. Lubricate two new preformed packings (Figure 2, Item 4) with petroleum jelly. Remove caps/plugs installed and install two new preformed packings onto two straight pipe-to-tube adapters (Figure 2, Item 3).
2. Remove caps/plugs on two hydraulic hoses and install two straight pipe-to-tube adapters (Figure 2, Item 3) and two hydraulic lines (Figure 2, Item 1) to hydraulic pump (Figure 2, Item 2).
3. Align and install hydraulic pump (Figure 2, Item 2) onto APU (Figure 2, Item 7).
4. Secure hydraulic pump (Figure 2, Item 2) to APU (Figure 2, Item 7) with two lockwashers (Figure 2, Item 6) and capscrews (Figure 2, Item 5).
5. Open hydraulic tank oil valve (WP 0004).



HETT0478

Figure 2. Hydraulic Pump Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Reconnect battery negative (black) cable to battery (WP 0053).

Perform hydraulic system check/fill (WP 0039).

END OF WORK PACKAGE

FIELD MAINTENANCE**FOUR-WAY DIRECTIONAL CONTROL VALVE BANK**

INITIAL SETUP:**Tools and Special Tools**

Handle, Ext, SPNSN ISOL Valve (WP 0168, Item 1)
General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Preformed Packing (2)

Lockwasher (6)

Valve Section Repair Kit (6)

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Hydraulic Fluid (WP 0170, Item 17)
Petroleum Jelly (WP 0170, Item 21)
Solvent, Cleaning Compound (WP 0170, Item 31)
Lockwasher (3)
Preformed Packing (10)

Personnel Required

2

Equipment Conditions

Platform adjusted to 50 in. (127 cm) height (WP 0008)

Suspension isolation valves at four corners of platform
closed, handles facing outward (WP 0004)

Hydraulic tank drained below system return line (WP 0040)

GENERAL INFORMATION

This work package contains instructions for the removal, repair, and installation of the four-way directional control valve bank.

REMOVAL**WARNING**

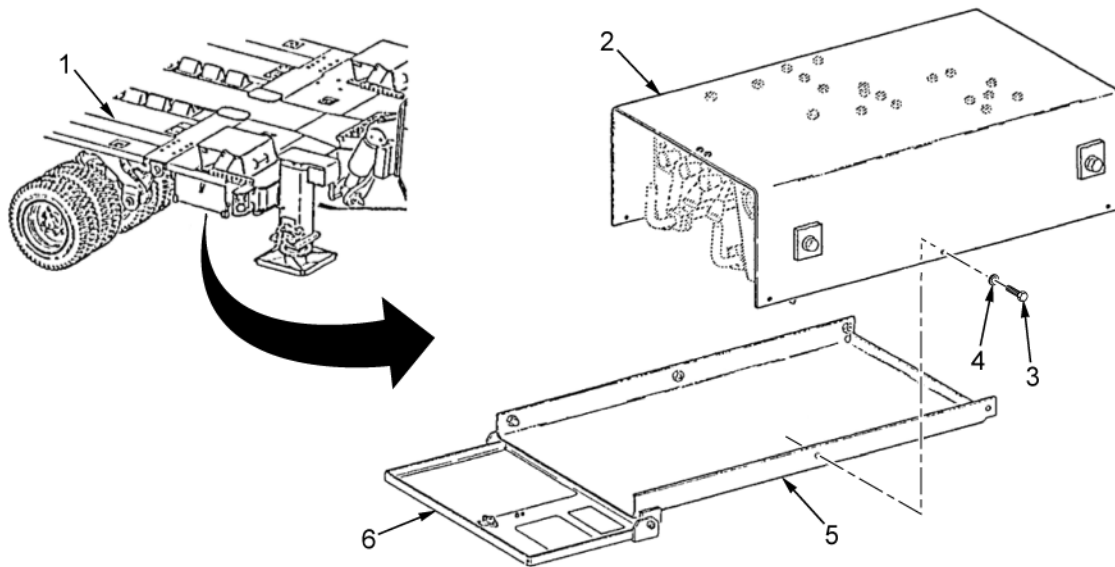
- Hydraulic fluid may be absorbed through the skin. Avoid prolonged exposure to skin and wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into the eyes, flush them immediately with water and seek medical attention. If hydraulic fluid gets on skin, wash thoroughly with soap and water. Wash hands thoroughly prior to eating or smoking.
- Hydraulic fluid may be hot if system has been in operation. Allow time for system to cool before performing maintenance.
- Residual pressure may remain in hydraulic lines; open fittings slowly.

Failure to follow these warnings may result in serious injury or death to personnel.

NOTE

When performing maintenance on hydraulic tubes and fittings, it is important to tag both ends of a tube or hose and tag all associated fittings with item numbers shown on the illustration. This method of tagging will ease installation.

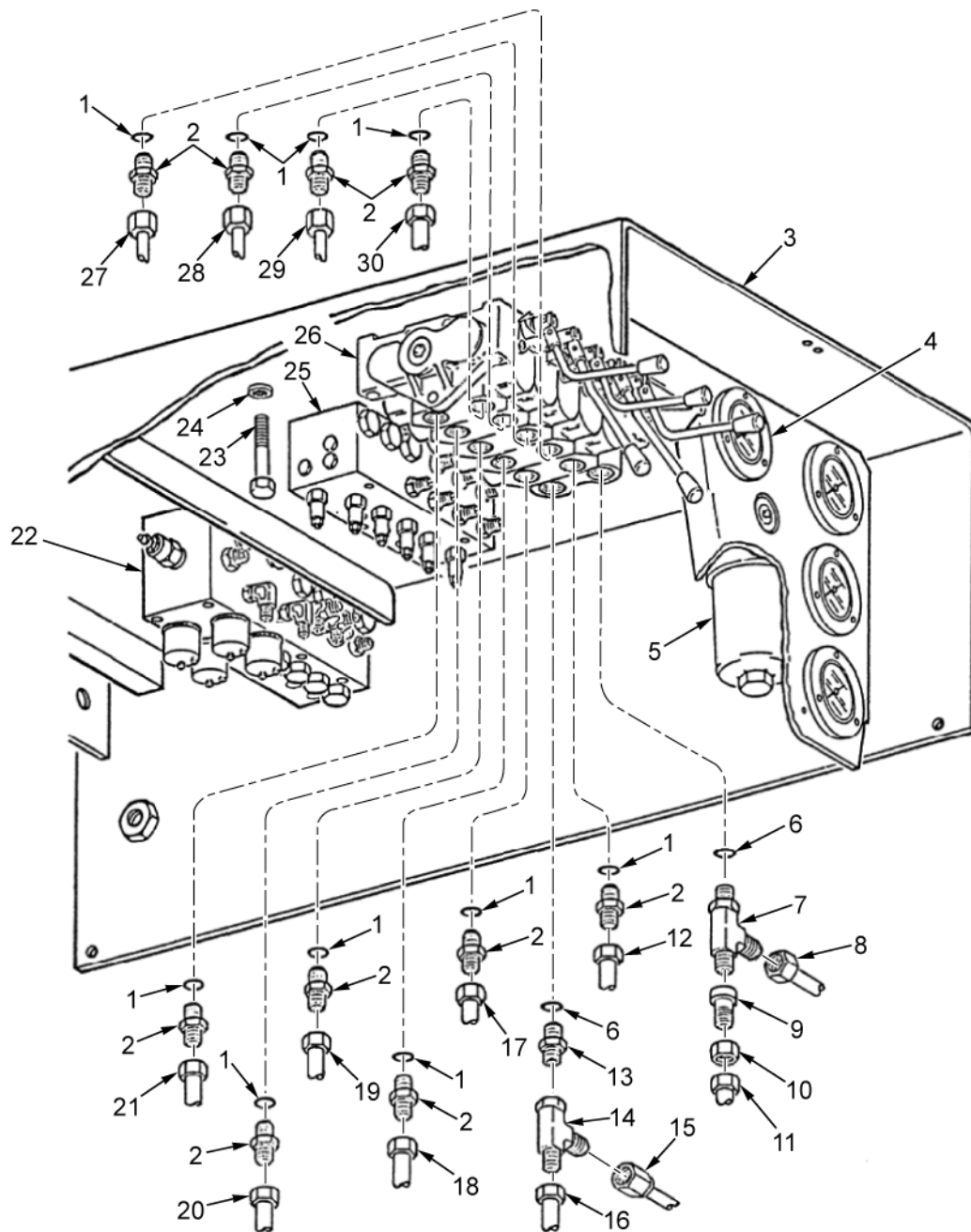
1. Ensure hydraulic control module (Figure 1, Item 2) door panel (Figure 1, Item 6) is lowered (WP 0004).
2. Use two people to remove six capscrews (Figure 1, Item 3), lockwashers (Figure 1, Item 4), and lower panel (Figure 1, Item 5) from hydraulic control module (Figure 1, Item 2). Carefully remove lower panel, with door panel (Figure 1, Item 6) attached, out from under semitrailer and place on platform (Figure 1, Item 1). Discard six lockwashers.



HETT0479

Figure 1. Four-Way Directional Control Valve Bank Removal.

3. Position drain pan under hydraulic control module (Figure 2, Item 3). Tag and disconnect four hydraulic tubes (Figure 2, Item 21, Item 28, Item 27, and Item 29) from straight pipe-to-tube adapters (Figure 2, Item 2) on four-way directional control valve (Figure 2, Item 26) and suspension manifold (Figure 2, Item 25). Install caps/plugs into tube openings.
4. Tag and disconnect hydraulic tubes (Figure 2, Item 17 and Item 12) from straight pipe-to-tube adapter (Figure 2, Item 2) on four-way directional control valve (Figure 2, Item 26) and from steering manifold (Figure 2, Item 22). Install caps/plugs into tube openings.
5. Tag and disconnect four hydraulic tubes (Figure 2, Item 18, Item 19, Item 20, and Item 30) from four straight pipe-to-tube adapters (Figure 2, Item 2) on four-way directional control valve (Figure 2, Item 26) and suspension manifold (Figure 2, Item 25). Install caps/plugs into tube openings.
6. Tag and disconnect hydraulic tube (Figure 2, Item 16) from tube tee (Figure 2, Item 14) and from hydraulic filter (Figure 2, Item 5). Use two wrenches to tag and disconnect hydraulic tube (Figure 2, Item 15) from tube tee on four-way directional control valve (Figure 2, Item 26) and from pressure gauge (Figure 2, Item 4). Install caps/plugs into tube openings.
7. Tag and disconnect hydraulic tubes (Figure 2, Item 11 and Item 8) from tube-to-boss tee (Figure 2, Item 7) on four-way directional control valve (Figure 2, Item 26) and from steering manifold (Figure 2, Item 22). Install caps/plugs into tube openings.
8. Use one person to support four-way directional control valve bank (Figure 2, Item 26); use second person to remove three capscrews (Figure 2, Item 23), lockwashers (Figure 2, Item 24), and four-way directional control valve bank from hydraulic control module (Figure 2, Item 3). Discard lockwashers.
9. Use two people to move four-way directional control valve bank (Figure 2, Item 26) out from under hydraulic control module (Figure 2, Item 3) and set on top of platform.
10. Remove ten straight pipe-to-tube adapters (Figure 2, Item 2) and preformed packings (Figure 2, Item 1) from four-way directional control valve bank (Figure 2, Item 26). Discard preformed packings. Install caps/plugs onto fittings and into valve bank openings.
11. Remove tube tee (Figure 2, Item 12), pipe adapter (Figure 2, Item 13), and preformed packing (Figure 2, Item 6) from four-way directional control valve bank (Figure 2, Item 26). Discard preformed packing. Install caps/plugs onto fitting and into valve bank opening.
12. Use 1 1/4 in. wrench to remove tube coupling nut (Figure 2, Item 10), tube reducer (Figure 2, Item 9), tube-to-boss tee (Figure 2, Item 15), and preformed packing (Figure 2, Item 6) from four-way directional control valve bank (Figure 2, Item 26). Discard preformed packing. Install caps/plugs onto fittings and into valve bank openings.
13. Remove all five valve handles from four-way directional control valve bank (WP 0112).



HETT0480

Figure 2. Four-Way Directional Control Valve Bank Removal.

END OF TASK

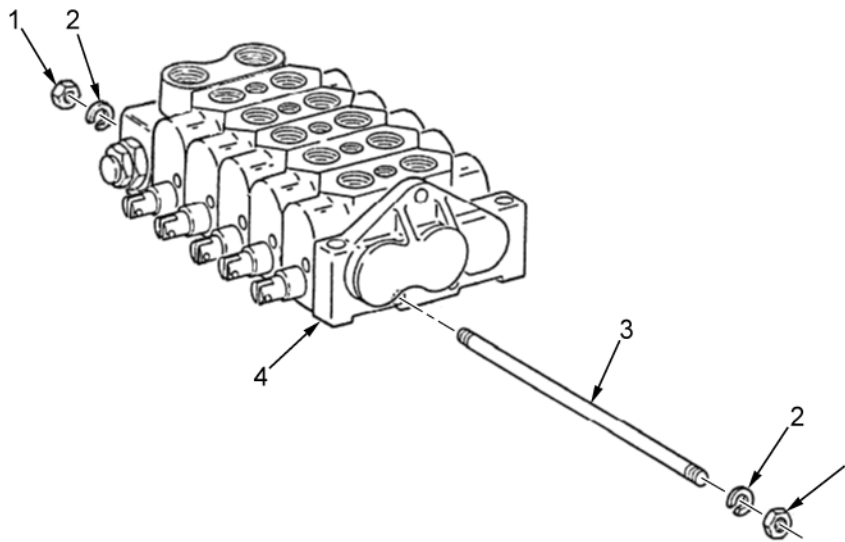
REPAIR**CAUTION**

A clean area must be maintained during disassembly of the four-way directional control valve bank or contaminants may enter one of the valve sections and cause premature failure of the valve bank or damage to equipment may result.

NOTE

The stud assembly has a nut and lockwasher on each end. Use a tool at each end to hold one nut and loosen the other nut during removal of stud assembly.

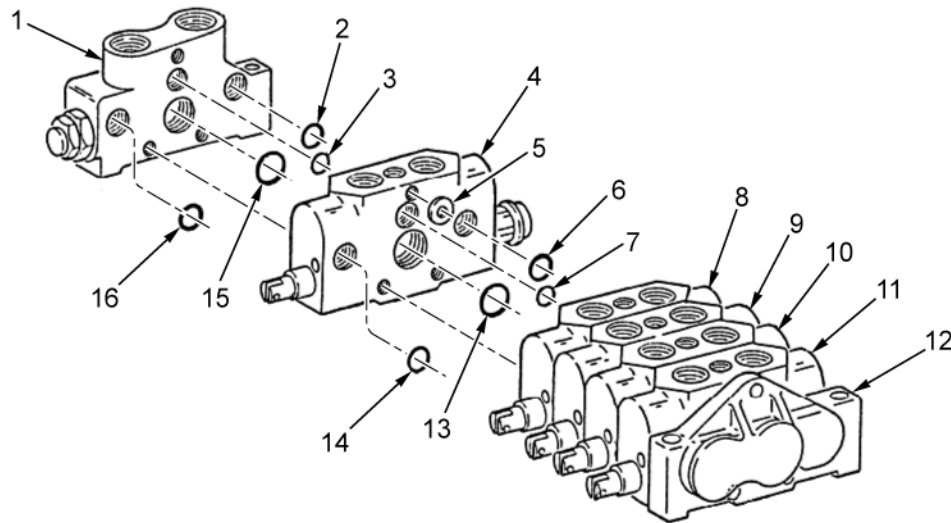
1. Remove three nuts (Figure 3, Item 1), lockwashers (Figure 3, Item 2), and stud assemblies (Figure 3, Item 3) from valve bank (Figure 3, Item 4). Discard all lockwashers from stud assemblies.



HETT0905

Figure 3. Four-Way Directional Control Valve Bank Removal/Repair.

2. Use suitable prying device to carefully pry valve inlet (Figure 4, Item 1) from linear directional control valve (Figure 4, Item 4). Remove preformed packings (Figure 4, Item 2, Item 3, Item 15, and Item 16) from valve inlet. Discard preformed packings.
3. Use suitable prying device to carefully pry linear directional control valve (Figure 4, Item 4) from linear directional control valve (Figure 4, Item 8). Remove preformed packings (Figure 4, Item 6, Item 7, Item 13, and Item 14) and shim (Figure 4, Item 5) from between linear directional control valves. Discard preformed packings and shim.
4. Repeat step 3 for disassembly/removal of all preformed packings/shims between linear directional control valves (Figure 4, Item 8, Item 9, Item 10, and Item 11) and valve outlet (Figure 4, Item 12). Remove and discard all preformed packings and shims.



HETT0913

Figure 4. Four-Way Directional Control Valve Bank Removal/Repair.

WARNING

Cleaning compound solvent is used to clean parts and is potentially dangerous to personnel. Extinguish all smoking materials and do not allow sparks or open flame near the work area. Use skin and eye protection and work in a well-ventilated area. Failure to follow this warning may result in injury to personnel.

5. Clean all tubes, fittings, attaching hardware, linear directional control valves, valve inlet, and valve outlet sections in degreaser tank with cleaning compound solvent.
6. Inspect linear directional control valves, valve inlet, and valve outlet for pitting, cracks, and wear. If defective, replace valve sections as required.

WARNING

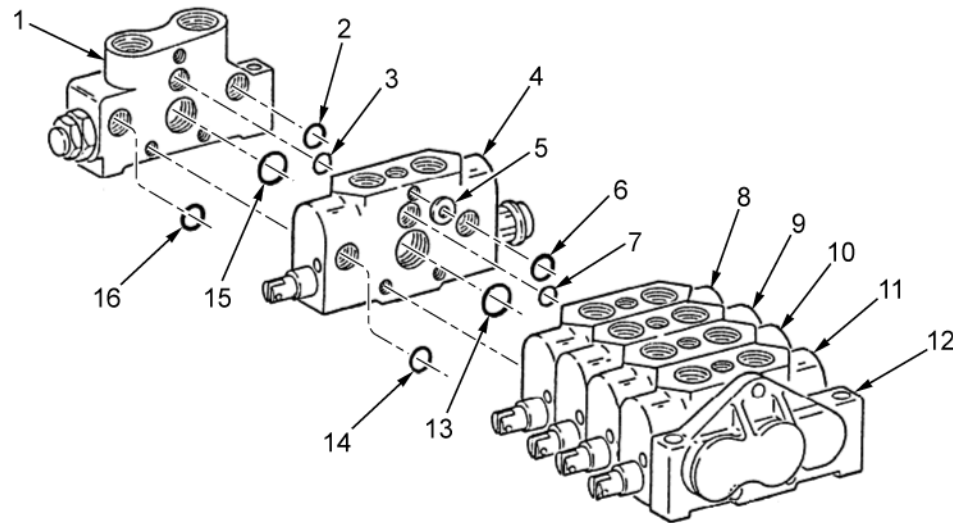
Compressed air used for cleaning/drying may create airborne particles that may injure the eyes. Always wear eye protection. Pressure must not exceed 30 psi (207 kPa). Failure to follow this warning may result in injury to personnel.

7. Inspect all valve ports and openings for foreign objects, dirt, and clogged passageways. Use compressed air to clear clogged passageways.
8. Inspect all hydraulic tubes removed for kinks, pin hole leaks, pitted and split flares, and clogged passageways. Use compressed air to clear clogged passageways. Replace any defective tubes.
9. Pour clean hydraulic fluid onto linear directional control valves (Figure 5, Item 4, Item 8, Item 9, Item 10, and Item 11), valve inlet (Figure 5, Item 1), and valve outlet (Figure 5, Item 12) to flush out contaminants.
10. Replace all parts found defective and replace all preformed packings (Figure 5, Item 2, Item 3, Item 6, Item 7, Item 13, Item 14, Item 15, and Item 16) and shims (Figure 5, Item 5) using respective repair kits.
11. Apply petroleum jelly to new preformed packings (Figure 5, Item 2, Item 3, Item 15, and Item 16). Install new preformed packings onto valve inlet (Figure 5, Item 1).

CAUTION

One person must be used to hold the assembled pieces together during the entire assembly process until the stud assembly can be installed, or misalignment or damage to new preformed packings may result.

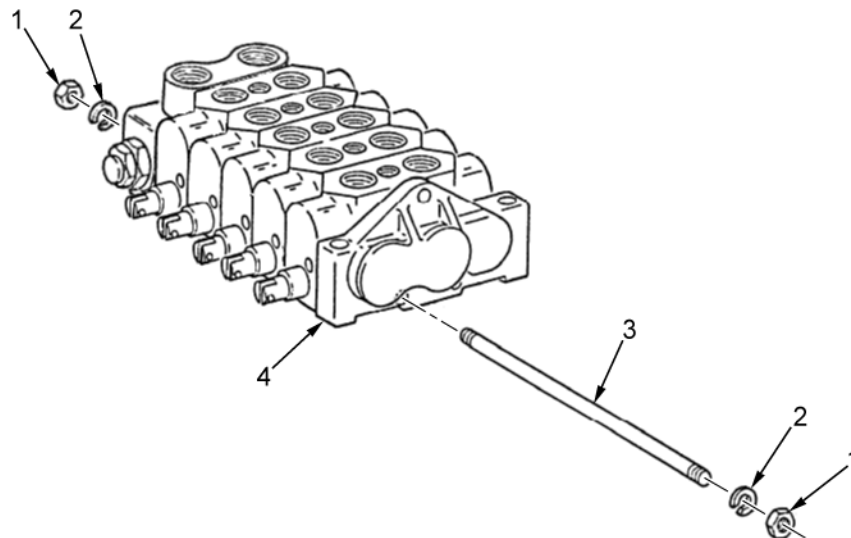
12. Assemble valve inlet (Figure 5, Item 1) to linear directional control valve (Figure 5, Item 4). Once valve inlet and control valve are assembled, use one person to hold pieces together.
13. Apply petroleum jelly to new preformed packings (Figure 5, Item 6, Item 7, Item 13, and Item 14) and shim (Figure 5, Item 5). Install new preformed packings and shim onto linear directional control valve (Figure 5, Item 4).
14. Assemble linear directional control valve (Figure 5, Item 4) to linear directional control valve (Figure 5, Item 8). Once linear directional control valve and linear directional control valve are assembled, use one person to hold all pieces together.
15. Repeat steps 13 and 14 as required to place all preformed packings (Figure 5, Item 6, Item 7, Item 13, and Item 14) and shim (Figure 5, Item 5) between linear directional control valves (Figure 5, Item 9, Item 10, and Item 11) and valve outlet (Figure 5, Item 12).



HETT0913

Figure 5. Four-Way Directional Control Valve Bank Removal/Repair.

16. Align and install three stud assemblies (Figure 6, Item 3) through four-way directional control valve bank (Figure 6, Item 4) and secure with three nuts (Figure 6, Item 1) and lockwashers (Figure 6, Item 2). Use torque wrench to torque three nuts to 19 to 21 lb-ft (25.8 to 28.4 Nm).



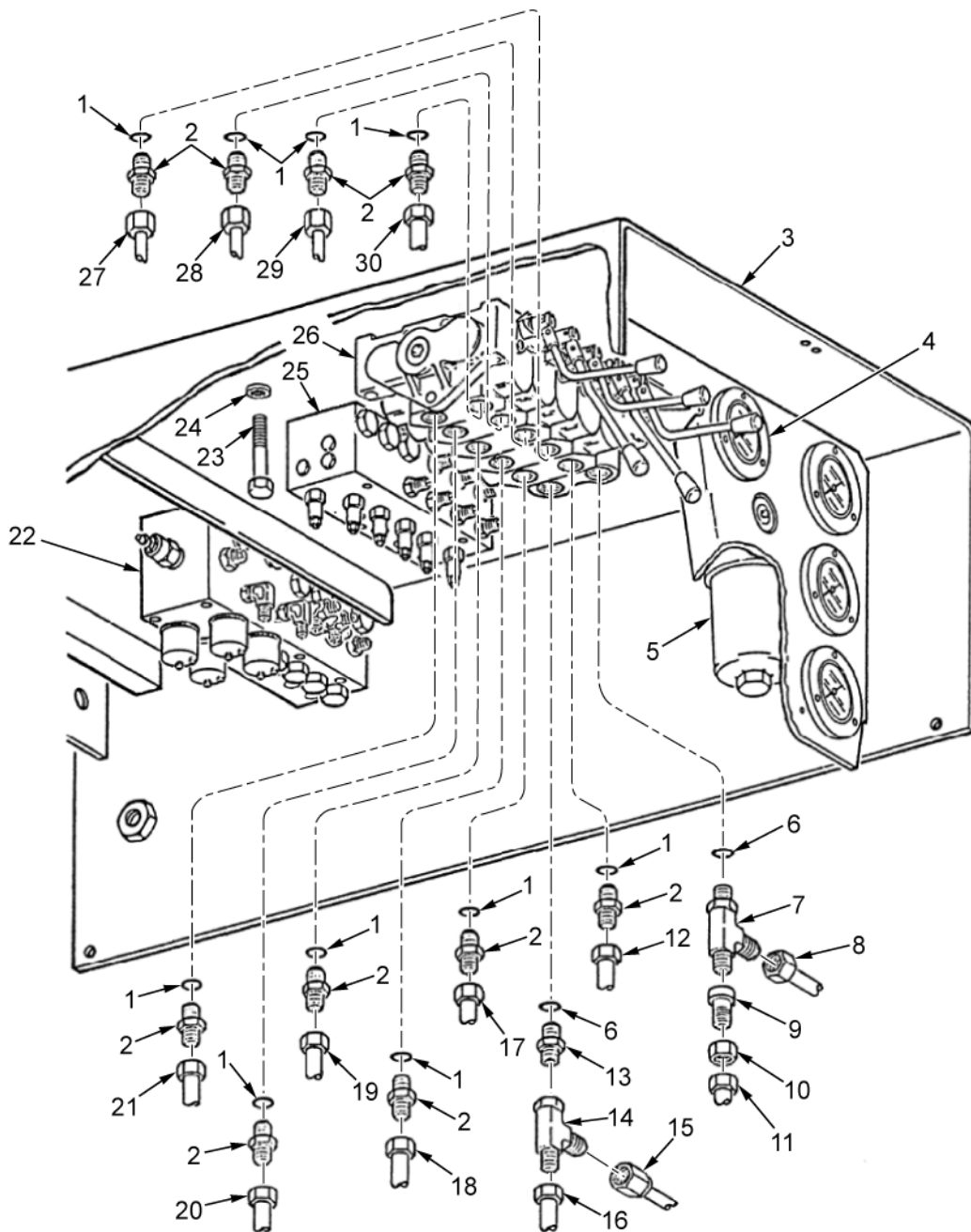
HETT0905

Figure 6. Four-Way Directional Control Valve Bank Removal/Repair.

END OF TASK

INSTALLATION

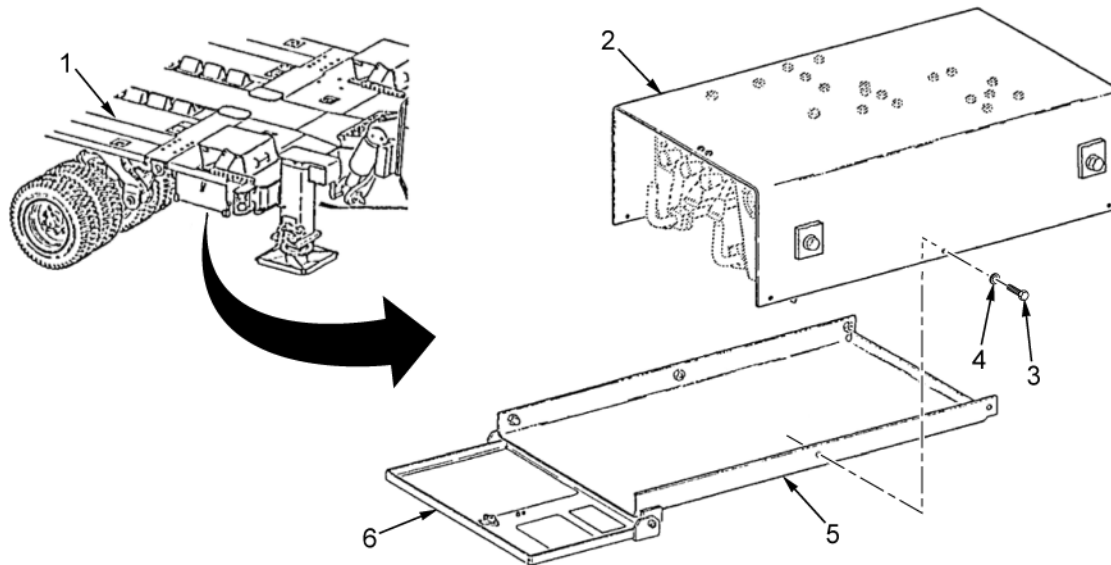
1. Align and install all five valve handles to bank valve (WP 0112).
2. Apply petroleum jelly to preformed packing (Figure 7, Item 6). Remove caps/plugs installed and install preformed packing, tube-to-boss (Figure 7, Item 15), tube reducer (Figure 7, Item 9), and tube coupling nut (Figure 7, Item 10) onto four-way directional control valve bank (Figure 7, Item 26).
3. Apply petroleum jelly to preformed packing (Figure 7, Item 6). Remove caps/plugs installed and install preformed packing, pipe adapter (Figure 7, Item 13), and tube tee (Figure 7, Item 12) onto four-way directional control valve bank (Figure 7, Item 26).
4. Apply petroleum jelly to ten preformed packings (Figure 7, Item 1). Remove caps/plugs installed and install ten preformed packings and straight pipe-to-tube adapters (Figure 7, Item 2) onto four-way directional control valve bank (Figure 7, Item 26).
5. Use one person to align and support four-way directional control valve bank (Figure 7, Item 26) with hydraulic control module frame (Figure 7, Item 3).
6. Use one person to hold the four-way directional control valve bank (Figure 7, Item 26) in place; use second person to install three capscrews (Figure 7, Item 23) and lockwashers (Figure 7, Item 24).
7. Remove caps/plugs installed in tubes (Figure 7, Item 11 and Item 8). Install two hydraulic tubes onto tube-to-boss tee (Figure 7, Item 7) on four-way directional control valve bank (Figure 7, Item 26) and steering manifold (Figure 7, Item 22).
8. Remove caps/plugs installed in tubes (Figure 7, Item 15 and Item 16). Use two wrenches to install hydraulic tube onto tube tee (Figure 7, Item 14) on four-way directional control valve bank (Figure 7, Item 26) and pressure gauge (Figure 7, Item 4). Install hydraulic tube onto tube tee on four-way directional control valve bank and hydraulic filter (Figure 7, Item 5).
9. Remove caps/plugs installed in tubes (Figure 7, Item 30, Item 20, Item 19, and Item 18). Install four hydraulic tubes onto straight pipe-to-tube adapters (Figure 7, Item 2) on four-way directional control valve bank (Figure 7, Item 26) and suspension manifold (Figure 7, Item 25).
10. Remove caps/plugs installed in tubes (Figure 7, Item 12 and Item 17). Install two hydraulic tubes onto two straight pipe-to-tube adapters (Figure 7, Item 2) on four-way directional control valve bank (Figure 7, Item 26) and steering manifold (Figure 7, Item 22).
11. Remove caps/plugs installed in tubes (Figure 7, Item 29, Item 27, Item 28, and Item 21). Install four hydraulic tubes onto straight pipe-to-tube adapters (Figure 7, Item 2) on four-way directional control valve bank (Figure 7, Item 26) and suspension manifold (Figure 7, Item 25).



HETT0480

Figure 7. Four-Way Directional Control Valve Bank Installation.

12. Use two people to align and install lower panel (Figure 8, Item 5), with door panel (Figure 8, Item 6) attached, onto hydraulic control module (Figure 8, Item 2). Secure lower panel in place by installing six lockwashers (Figure 8, Item 3) and capscrews (Figure 8, Item 4) and attach onto underside of semitrailer and platform (Figure 8, Item 1).



HETT0479

Figure 8. Four-Way Directional Control Valve Bank Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Perform hydraulic system check/fill and refill hydraulic tank (WP 0039).

Operate all hydraulic controls on four-way directional control valve bank through several cycles and check for proper operation (WP 0004).

Bleed air from hydraulic system (WP 0041).

END OF WORK PACKAGE

FIELD MAINTENANCE
STEERING CONTROL MANIFOLD

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Check Valve Repair Kit (8)
Check Valve Repair Kit (4)

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Hydraulic Fluid (WP 0170, Item 17)
Petroleum Jelly (WP 0170, Item 21)
Solvent, Cleaning Compound (WP 0170, Item 31)
Lockwasher (4)
Preformed Packing (4)
Preformed Packing (13)
Check Valve Repair Kit (4)
Check Valve Repair Kit (1)

Personnel Required

2

Equipment Conditions

Platform adjusted to 50 in. (127 cm) height (WP 0008)
Suspension isolation valves at four corners of platform closed, handles facing outward (WP 0004)
Hydraulic tank drained below system return line (WP 0040)
Bottom cover of hydraulic control module removed and jumper wires to pressure switches removed (WP 0057)

GENERAL INFORMATION

This work package contains instructions for the removal, repair, and installation of the steering control manifold.

REMOVAL**WARNING**

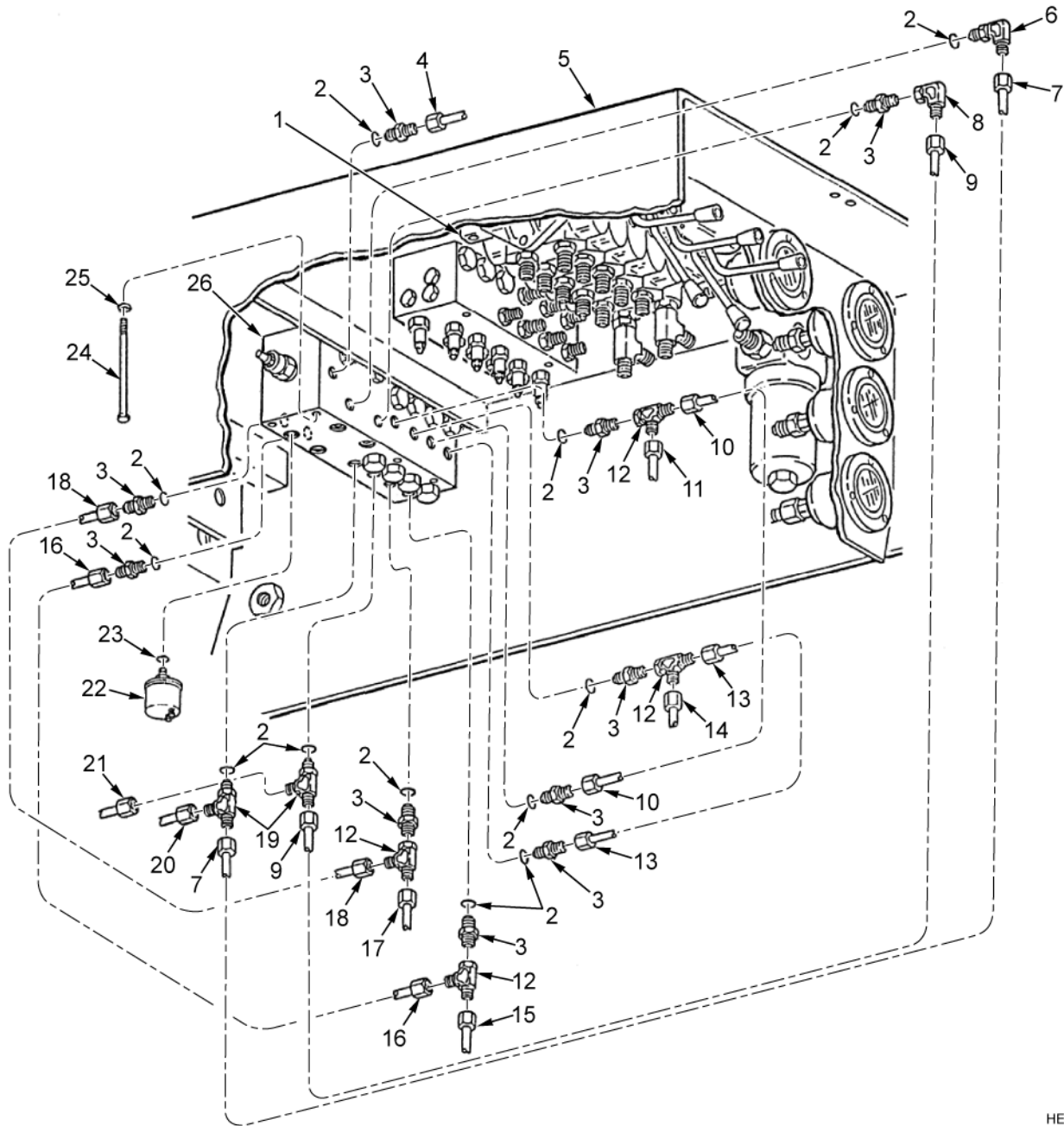
- **Hydraulic fluid may be hot if system has been in operation. Allow time for system to cool before performing maintenance or injury to personnel may result.**
- **Residual pressure may remain in hydraulic lines. Open fittings slowly or injury to personnel may result.**
- **Hydraulic fluid may be absorbed through the skin. Avoid prolonged exposure to skin and wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into the eyes, flush them immediately with water and seek medical attention. If hydraulic fluid gets on skin, wash thoroughly with soap and water. Wash hands thoroughly prior to eating or smoking. Failure to follow this warning may result in injury to personnel.**

NOTE

When performing maintenance on hydraulic tubes and fittings, it is important to tag both ends of a tube or hose and tag all associated fittings with item numbers shown on the illustration. This method of tagging will ease installation.

1. Use drain pan for drainage. Tag and disconnect two hydraulic tubes (Figure 1, Item 21 and Item 20) from two tube-to-boss tees (Figure 1, Item 19) on steering manifold (Figure 1, Item 26) on hydraulic control module (Figure 1, Item 5). Install caps/plugs into openings.
2. Tag and disconnect two hydraulic tubes (Figure 1, Item 15 and Item 17) from two tube tees (Figure 1, Item 12) on steering manifold (Figure 1, Item 26). Install caps/plugs into openings.
3. Tag and disconnect hydraulic tube (Figure 1, Item 4) from straight pipe-to-tube adapter (Figure 1, Item 3) on steering control manifold (Figure 1, Item 26) and four-way directional control valve bank (Figure 1, Item 1). Install caps/plugs into openings.
4. Tag and disconnect two hydraulic tubes (Figure 1, Item 11 and Item 14) from tube tees (Figure 1, Item 12) on steering control manifold (Figure 1, Item 26) and four-way directional control valve bank (Figure 1, Item 1). Install caps/plugs into openings.
5. Use one person to support steering control manifold (Figure 1, Item 26); use second person to remove four capscrews (Figure 1, Item 24), lockwashers (Figure 1, Item 25), and steering control manifold from hydraulic control module frame (Figure 1, Item 5). Set steering control manifold onto platform. Discard lockwashers.
6. Tag and disconnect two hydraulic tubes (Figure 1, Item 7 and Item 9) from two tube tees (Figure 1, Item 19), tube-to-boss elbow (Figure 1, Item 6), and tube elbow (Figure 1, Item 8) on steering control manifold (Figure 1, Item 26). Install caps/plugs into openings.
7. Tag and disconnect two hydraulic tubes (Figure 1, Item 10 and Item 13) from two tube tees (Figure 1, Item 12) and straight pipe-to-tube adapters (Figure 1, Item 3) on steering control manifold (Figure 1, Item 26). Install caps/plugs into openings.
8. Tag and disconnect two hydraulic tubes (Figure 1, Item 18 and Item 16) from two tube tees (Figure 1, Item 12) and straight pipe-to-tube adapters (Figure 1, Item 3) on steering control manifold (Figure 1, Item 26). Install caps/plugs into openings.
9. Tag and disconnect four pressure switches (Figure 1, Item 22) and preformed packings (Figure 1, Item 23) from steering control manifold (Figure 1, Item 26). Discard preformed packings. Install caps/plugs into openings.
10. Unscrew and remove four tube tees (Figure 1, Item 12) and tube elbow (Figure 1, Item 8) from five straight pipe-to-tube adapters (Figure 1, Item 3). Install caps/plugs onto fittings.
11. Unscrew and remove two tube-to-boss tees (Figure 1, Item 19) and preformed packings (Figure 1, Item 2) from steering control manifold (Figure 1, Item 26). Discard preformed packings and install caps/plugs onto tube-to-boss tees.

12. Tag and disconnect ten straight pipe-to-tube adapters (Figure 1, Item 3) and remove ten preformed packings (Figure 1, Item 2). Tag and remove tube-to-boss elbow (Figure 1, Item 6) and preformed packing. Discard preformed packings and install caps/plugs into openings and onto fittings.



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Figure 1. Steering Control Manifold Removal.

END OF TASK

REPAIR**CAUTION**

A clean area must be maintained during disassembly of the steering control manifold or contaminants may enter one of the cartridges and cause premature failure of the manifold.

1. Remove four CXDA XAN check valves (Figure 2, Item 7), as required, from steering control manifold (Figure 2, Item 2). Install caps/plugs into all openings.
2. Disassemble CXDA XAN check valves (Figure 2, Item 7) as follows:
 - a. Remove backup ring (Figure 2, Item 4), preformed packing (Figure 2, Item 3), backup ring (Figure 2, Item 5), and preformed packing (Figure 2, Item 6) from CXDA XAN check valve (Figure 2, Item 7). Discard preformed packings and backup rings.
 - b. Repeat step 2a as required for disassembly of remaining CXDA XAN check valves (Figure 2, Item 7).
3. Remove RPEC LCN safety relief valve (Figure 2, Item 12) from steering control manifold (Figure 2, Item 2). Install caps/plugs into openings.
4. Disassemble RPEC LCN safety relief valve (Figure 2, Item 12) by removing preformed packing (Figure 2, Item 8), backup ring (Figure 2, Item 9), backup ring (Figure 2, Item 10), and preformed packing (Figure 2, Item 11) from RPEC LCN safety relief valve. Discard preformed packings and backup rings.
5. Remove eight check valves (Figure 2, Item 13), as required, from steering control manifold (Figure 2, Item 2). Install caps/plugs into openings.
6. Disassemble check valve (Figure 2, Item 13) as follows:
 - a. Remove backup ring (Figure 2, Item 17), preformed packing (Figure 2, Item 16), backup ring (Figure 2, Item 15), and preformed packing (Figure 2, Item 14) from check valve (Figure 2, Item 13). Discard preformed packings and backup rings.
 - b. Repeat step 6a, as required, for disassembly of remaining check valves (Figure 2, Item 13).
7. Remove four CKCB XCN check valves (Figure 2, Item 1), as required, from steering control manifold (Figure 2, Item 2). Install caps/plugs into all openings.
8. Disassemble CKCB XCN check valve (Figure 2, Item 1) as follows:
 - a. Remove preformed packing (Figure 2, Item 18), backup rings (Figure 2, Item 19 and Item 20), two preformed packings (Figure 2, Item 21), and backup ring (Figure 2, Item 22) from CKCB XCN check valve (Figure 2, Item 1). Discard preformed packings and backup rings.
 - b. Repeat step 8a, as required, for disassembly of remaining CKCB XCN check valves (Figure 2, Item 1).

WARNING

Cleaning compound solvent is used to clean parts and is potentially dangerous to personnel. Extinguish all smoking materials and do not allow sparks or open flame near the work area. Use skin and eye protection and work in a well-ventilated area. Failure to follow this warning may result in injury to personnel.

9. Clean all tubes, fittings, attaching hardware, steering control manifold, safety relief valve, and all check valves in degreaser tank with cleaning compound solvent.

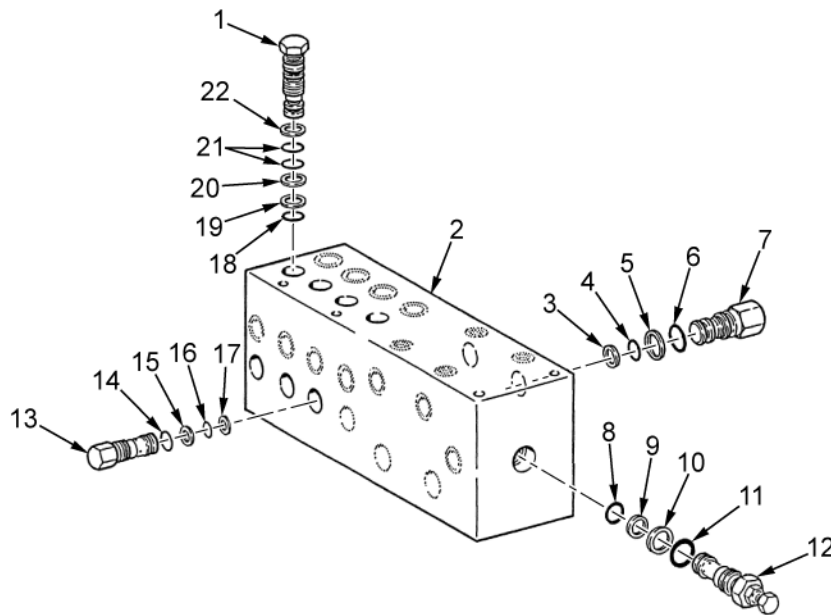
10. Inspect safety relief valve and all check valves for pitting, cracks, and wear. If defective, replace parts as required.

WARNING



Compressed air used for cleaning/drying may create airborne particles that may injure the eyes. Always wear eye protection. Pressure must not exceed 30 psi (207 kPa) or injury to personnel may result.

11. Inspect all ports and openings in steering control manifold, safety relief valve, and all check valves for foreign objects, dirt, and clogged passageways. Use compressed air to clear clogged passageways.
12. Inspect all hydraulic tubes removed for kinks, pin hole leaks, pitted and split flares, and clogged passageways. Use compressed air to clear clogged passageways. Replace any defective tubes.
13. Pour clean hydraulic fluid into steering control manifold, safety relieve valve, and all check valves to flush out contaminants.
14. Replace all parts found defective and replace all preformed packings (Figure 2, Item 3, Item 6, Item 8, Item 11, Item 14, Item 16, Item 18, and Item 21) and backup rings (Figure 2, Item 4, Item 9, Item 10, Item 15, Item 17, Item 19, Item 20, and Item 22) using respective repair kits.



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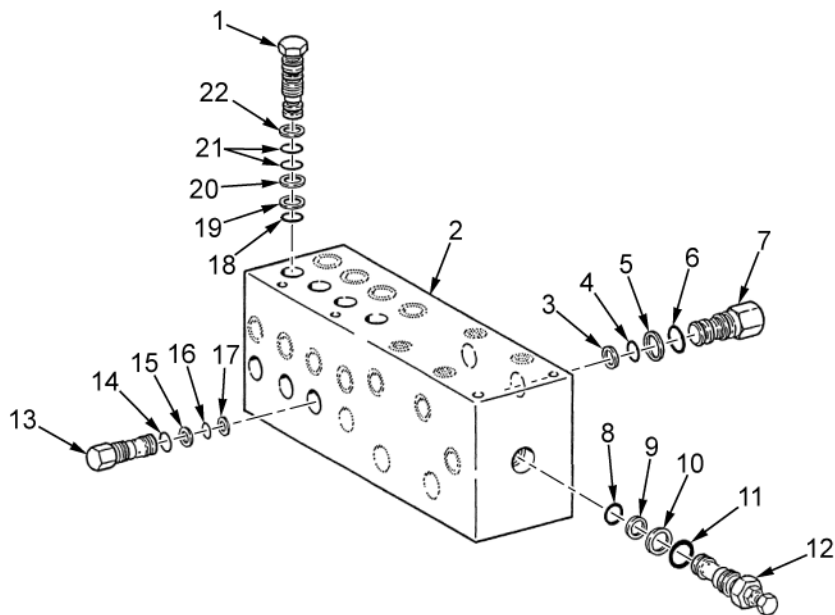
Figure 2. Steering Control Manifold Repair.

CAUTION

As the safety relief valve and check valves are assembled, the arrangement of preformed packings and backup rings is extremely important. If the preformed packing and backup rings are improperly installed, internal leakage or premature equipment failure may result. Use the illustration shown in Figure 3 for proper arrangement of parts.

15. Apply petroleum jelly to new preformed packings (Figure 3, Item 21 and Item 18) and new backup rings (Figure 3, Item 22, Item 20, and Item 19).
16. Install new backup ring (Figure 3, Item 22), two preformed packings (Figure 3, Item 21), backup rings (Figure 3, Item 20 and Item 19), and preformed packing (Figure 3, Item 18) onto CKCB XCN check valve (Figure 3, Item 1).
17. Repeat steps 15 and 16, as required, for all CKCB XCN check valves (Figure 3, Item 1) disassembled.
18. Remove caps/plugs installed into steering control manifold (Figure 3, Item 2) and install four CKCB XCN check valves (Figure 3, Item 1), as required, into steering control manifold.
19. Apply petroleum jelly to new preformed packings (Figure 3, Item 14 and Figure 3, Item 16) and new backup rings (Figure 3, Item 15 and Item 17).
20. Install new preformed packing (Figure 3, Item 14), backup ring (Figure 3, Item 15), preformed packing (Figure 3, Item 16), and backup ring (Figure 3, Item 17) onto check valve (Figure 3, Item 13).
21. Repeat steps 19 and 20, as required, for all check valves (Figure 3, Item 13) disassembled.
22. Remove caps/plugs installed into steering control manifold (Figure 3, Item 2) and install eight check valves (Figure 3, Item 13), as required, into steering control manifold.
23. Apply petroleum jelly to new preformed packings (Figure 3, Item 11 and Item 8) and new backup rings (Figure 3, Item 10 and Item 9).
24. Install preformed packing (Figure 3, Item 11), backup ring (Figure 3, Item 10), backup ring (Figure 3, Item 9), and preformed packing (Figure 3, Item 8) onto RPEC LCN safety relief valve (Figure 3, Item 12).
25. Remove caps/plugs installed into steering control manifold (Figure 3, Item 2) and install RPEC LCN safety relief valve (Figure 3, Item 12) into steering control manifold.
26. Apply petroleum jelly to preformed packings (Figure 3, Item 6 and Item 4) and backup rings (Figure 3, Item 5 and Item 3).
27. Install preformed packing (Figure 3, Item 6), backup ring (Figure 3, Item 5), preformed packing (Figure 3, Item 4), and backup ring (Figure 3, Item 3) onto CXDA XAN check valve (Figure 3, Item 7).

28. Repeat steps 26 and 27, as required, for all CXDA XAN check valves (Figure 3, Item 7) disassembled.
29. Remove caps/plugs installed into steering control manifold (Figure 3, Item 2) and install four CXDA XAN check valves (Figure 3, Item 7), as required, into steering control manifold.



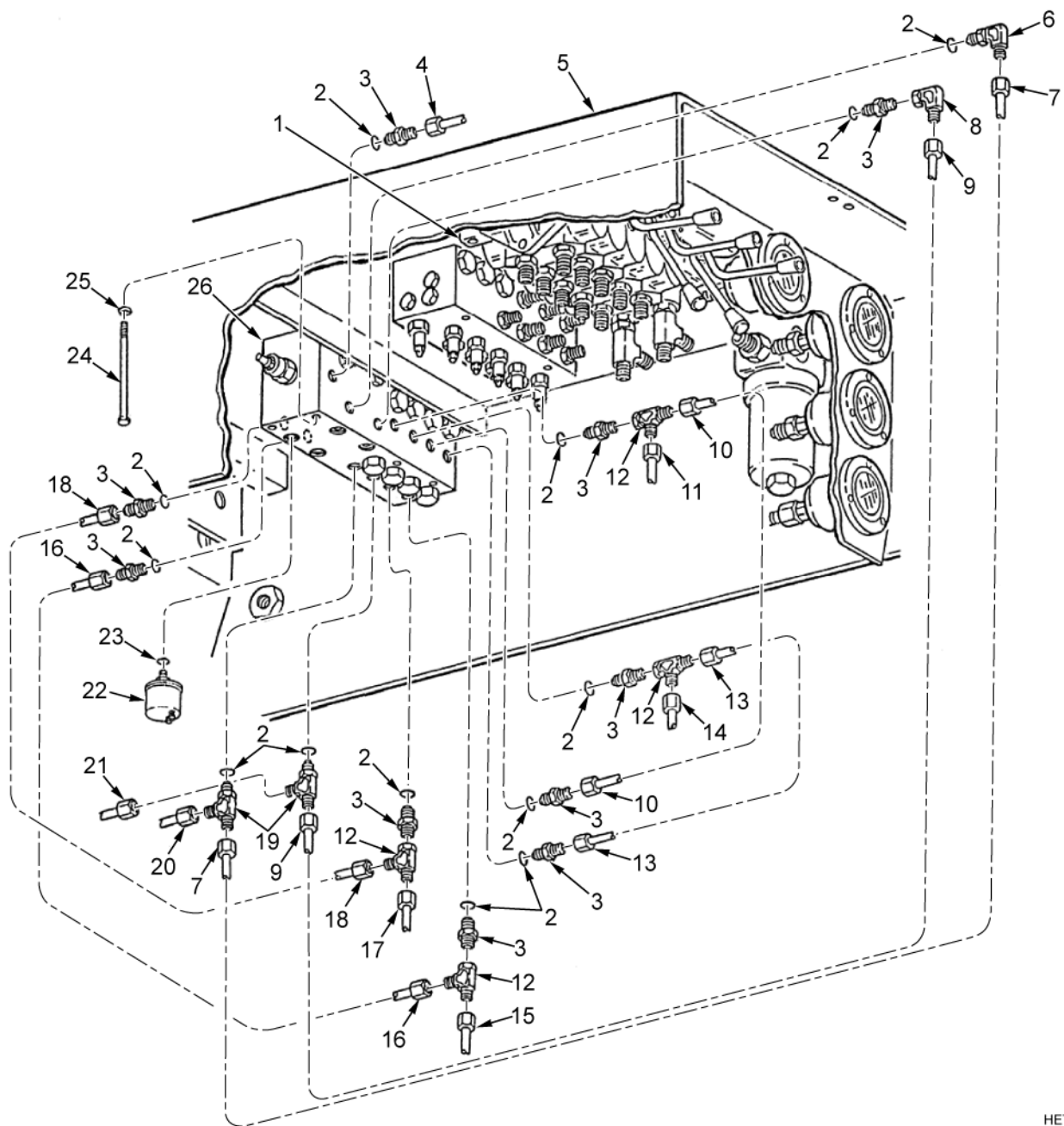
HETT0485

Figure 3. Steering Control Manifold Repair.

END OF TASK

INSTALLATION

1. Apply petroleum jelly to thirteen new preformed packings (Figure 4, Item 2) and four new preformed packings (Figure 4, Item 23).
2. Remove caps/plugs installed into fitting ports on steering control manifold (Figure 4, Item 26) and on tube-to-boss elbow (Figure 4, Item 6). Install new preformed packing (Figure 4, Item 2) onto tube-to-boss elbow. Install tube-to-boss elbow into steering control manifold.
3. Remove caps/plugs installed into fitting ports on steering control manifold (Figure 4, Item 26) and onto straight pipe-to-tube adapters (Figure 4, Item 3). Install ten new preformed packings (Figure 4, Item 2) onto straight pipe-to-tube adapters. Install ten straight pipe-to-tube adapters into place on steering control manifold.
4. Remove caps/plugs installed into fitting ports on steering control manifold (Figure 4, Item 26) and on tube-to-boss tees (Figure 4, Item 19). Install two new preformed packings (Figure 4, Item 2) onto tube-to-boss tees. Install two tube-to-boss tees into steering control manifold.
5. Remove caps/plugs installed onto four tube tees (Figure 4, Item 12) and tube elbow (Figure 4, Item 8). Install four tube tees and tube elbow onto five straight pipe-to-tube adapters (Figure 4, Item 3) on steering control manifold (Figure 4, Item 26).
6. Remove caps/plugs installed into fitting ports on steering control manifold (Figure 4, Item 26) and four pressure switches (Figure 4, Item 22). Install four new preformed packings (Figure 4, Item 23) onto four pressure switches and install four pressure switches into steering control manifold.
7. Remove caps/plugs installed on two hydraulic tubes (Figure 4, Item 16 and Item 18). Install two hydraulic tubes between two tube tees (Figure 4, Item 12) and straight pipe-to-tube adapters (Figure 4, Item 3).
8. Remove caps/plugs installed on two hydraulic tubes (Figure 4, Item 10 and Item 13). Install two hydraulic tubes between two tube tees (Figure 4, Item 12) and straight pipe-to-tube adapters (Figure 4, Item 3).
9. Remove caps/plugs installed on two hydraulic tubes (Figure 4, Item 7 and Item 9). Install two hydraulic tubes between two tube tees (Figure 4, Item 19) and tube elbow (Figure 4, Item 8) and tube-to-boss elbow (Figure 4, Item 6).
10. Use one person to align and support steering control manifold (Figure 4, Item 26) with hydraulic control module frame (Figure 4, Item 5).
11. With first person holding steering control manifold (Figure 4, Item 26) in place, use second person to install three capscrews (Figure 4, Item 24) and lockwashers (Figure 4, Item 25).
12. Remove caps/plugs installed on two hydraulic tubes (Figure 4, Item 11 and Item 14). Install two hydraulic tubes onto two tube tees (Figure 4, Item 12) on steering control manifold (Figure 4, Item 26) and four-way directional control valve bank (Figure 4, Item 1).
13. Remove caps/plugs installed in hydraulic tube (Figure 4, Item 4). Install hydraulic tube onto straight pipe-to-tube adapter (Figure 4, Item 3) on steering control manifold (Figure 4, Item 26) and four-way directional control valve bank (Figure 4, Item 1).
14. Remove caps/plugs installed on two hydraulic tubes (Figure 4, Item 15 and Item 17). Connect two hydraulic tubes onto two tube tees (Figure 4, Item 12) on steering control manifold (Figure 4, Item 26).
15. Remove caps/plugs installed on two hydraulic tubes (Figure 4, Item 20 and Item 21). Connect two hydraulic tubes onto two tube-to-boss tees (Figure 4, Item 19) on steering control manifold (Figure 4, Item 26).



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Figure 4. Steering Control Manifold Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Perform hydraulic system check/fill and refill hydraulic tank (WP 0039).

Manually adjust steering (WP 0007) and check for proper operation.

Bleed air from hydraulic system (WP 0041).

END OF WORK PACKAGE

FIELD MAINTENANCE
SUSPENSION CONTROL MANIFOLD

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Cartridge Repair Kit (1)

Cartridge Repair Kit (4)

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Hydraulic Fluid (WP 0170, Item 17)
Petroleum Jelly (WP 0170, Item 21)
Solvent, Cleaning Compound (WP 0170, Item 31)
Lockwasher (3)
Preformed Packing (20)
Cartridge Repair Kit (5)

Personnel Required

2

Equipment Conditions

Platform adjusted to 50 in. (127 cm) height (WP 0008)
Suspension isolation valves at four corners of platform closed, handles facing outward (WP 0004)
Hydraulic tank drained below system return line (WP 0040)

GENERAL INFORMATION

This work package contains instructions for the removal, repair, and installation of the suspension control manifold.

REMOVAL

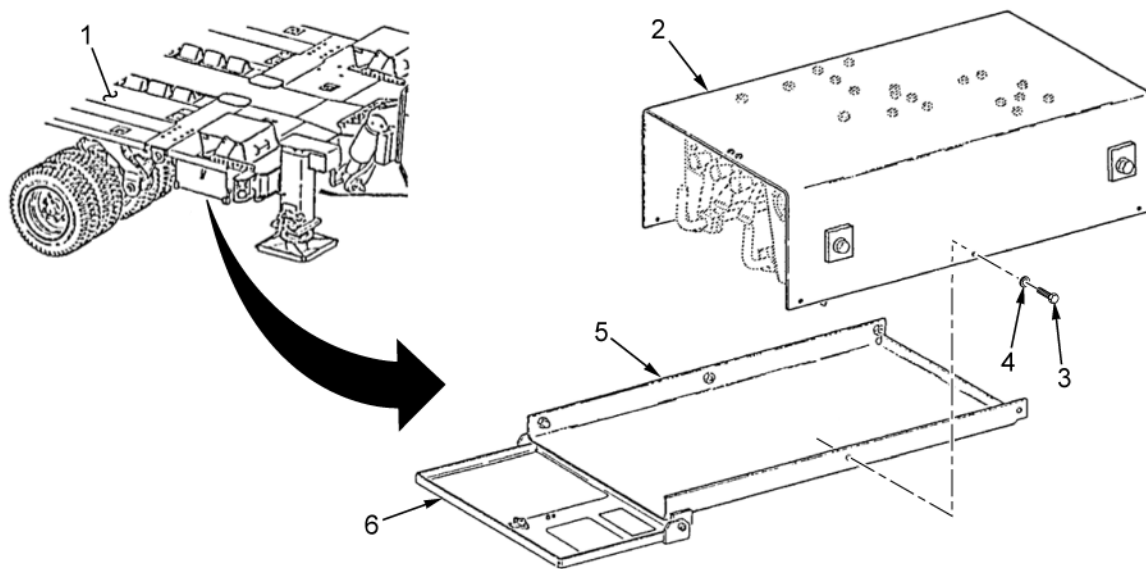
WARNING

- Hydraulic fluid may be hot if system has been in operation. Allow time for system to cool before performing maintenance or injury to personnel may result.
- Residual pressure may remain in hydraulic lines. Open fittings slowly or injury to personnel may result.
- Hydraulic fluid may be absorbed through the skin. Avoid prolonged exposure to skin and wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into the eyes, flush them immediately with water and seek medical attention. If hydraulic fluid gets on skin, wash thoroughly with soap and water. Wash hands thoroughly prior to eating or smoking.

NOTE

When performing maintenance on hydraulic tubes and fittings, it is important to tag both ends of a tube or hose and tag all associated fittings with item numbers shown on the illustration. This method of tagging will ease installation.

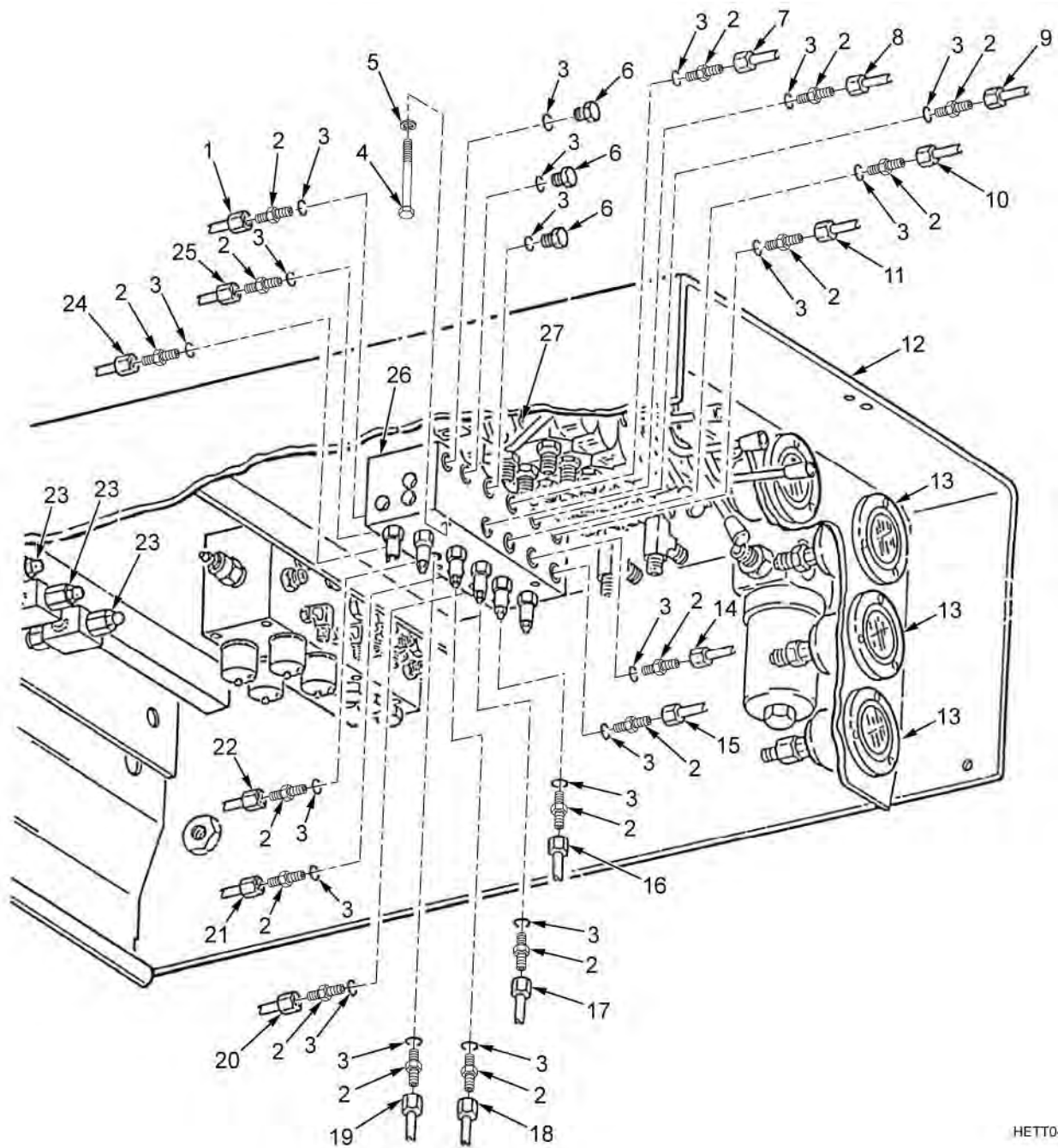
1. Ensure hydraulic control module door panel is lowered (WP 0004).
2. Use two people to remove six capscrews (Figure 1, Item 3), lockwashers (Figure 1, Item 4), and lower panel (Figure 1, Item 5) from hydraulic control module (Figure 1, Item 2). Carefully remove lower panel, with panel door (Figure 1, Item 6) attached, out from under semitrailer and place on platform (Figure 1, Item 1). Discard six lockwashers.



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Figure 1. Suspension Control Manifold Removal.

3. Remove clamp block and handle of suspension shutoff valve from hydraulic control module (WP 0115).
4. Use drain pan for drainage. Tag and disconnect four hydraulic tubes (Figure 2, Item 19, Item 18, Item 17, and Item 16) from four straight pipe-to-tube adapters (Figure 2, Item 2) on suspension control manifold (Figure 2, Item 26) and four-way directional control valve bank (Figure 2, Item 27). Install caps/plugs into tube openings.
5. Tag and disconnect five hydraulic tubes (Figure 2, Item 20, Item 21, Item 22, Item 24, and Item 25) from five straight pipe-to-tube adapters (Figure 2, Item 2) on suspension control manifold (Figure 2, Item 26) and suspension shutoff valve (Figure 2, Item 23). Install caps/plugs into tube openings.
6. Tag and disconnect hydraulic tube (Figure 2, Item 1) from straight pipe-to-tube adapter (Figure 2, Item 2) on suspension control manifold (Figure 2, Item 26) and bulkhead fitting at back of control module frame (Figure 2, Item 12). Install caps/plugs into tube.
7. Tag and disconnect four hydraulic tubes (Figure 2, Item 15, Item 14, Item 10, and Item 8) from four straight pipe-to-tube adapters (Figure 2, Item 2) on suspension control manifold (Figure 2, Item 26) and four-way directional control valve bank (Figure 2, Item 27). Install caps/plugs into tube openings.
8. Use two wrenches to tag and disconnect three hydraulic tubes (Figure 2, Item 7, Item 9, and Item 11) from three straight pipe-to-tube adapters (Figure 2, Item 2) on suspension control manifold (Figure 2, Item 26) and fittings on three pressure gauges (Figure 2, Item 13). Install caps/plugs into tubes and onto gauge fittings.
9. Use one person to support suspension control manifold (Figure 2, Item 26); use second person to remove three capscrews (Figure 2, Item 4), lockwashers (Figure 2, Item 5), and suspension control manifold from hydraulic control module frame (Figure 2, Item 12). Set suspension control manifold on platform. Discard lockwashers.
10. Remove three tube fitting plugs (Figure 2, Item 6) and three preformed packings (Figure 2, Item 3). Discard preformed packings and install caps/plugs into openings.
11. Remove seventeen straight pipe-to-tube adapters (Figure 2, Item 2) and preformed packings (Figure 2, Item 3) from suspension control manifold (Figure 2, Item 26). Discard preformed packings and install caps/plugs into manifold openings and onto fittings.



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Figure 2. Suspension Control Manifold Removal.

END OF TASK

REPAIR**CAUTION**

A clean area must be maintained during disassembly of the suspension control manifold or contaminants may enter one of the cartridges and cause premature failure of the manifold.

1. Remove five CBCG LCN cartridge valves (Figure 3, Item 1) from suspension control manifold (Figure 3, Item 14). Install caps/plugs into all openings.
2. Disassemble CBCG LCN cartridge valve (Figure 3, Item 1) as follows:
 - a. Remove preformed packing (Figure 3, Item 15), backup rings (Figure 3, Item 16 and Item 17), preformed packings (Figure 3, Item 18 and Item 19), and backup ring (Figure 3, Item 20). Discard preformed packings and backup rings.
 - b. Repeat step 2a as required for disassembly of remaining CBCG LCN cartridge valves (Figure 3, Item 1).
3. Remove CBCA LAN cartridge valve (Figure 3, Item 2) from suspension control manifold (Figure 3, Item 14). Install caps/plugs into all openings.
4. Disassemble CBCA LAN cartridge valve (Figure 3, Item 2) by removing preformed packing (Figure 3, Item 8), backup rings (Figure 3, Item 7 and Item 6), preformed packings (Figure 3, Item 5 and Item 4), and backup ring (Figure 3, Item 3). Discard preformed packings and backup rings.
5. Remove four FCCB XAN flow regulating valves (Figure 3, Item 9) from suspension control manifold (Figure 3, Item 14). Install caps/plugs into all openings.
6. Disassemble FCCB XAN flow regulating valves (Figure 3, Item 9) as follows:
 - a. Remove preformed packing (Figure 3, Item 13), backup rings (Figure 3, Item 12 and Item 11), and preformed packing (Figure 3, Item 10). Discard preformed packings and backup rings.
 - b. Repeat step 6a as required for disassembly of remaining FCCB XAN flow regulating valves (Figure 3, Item 9).

WARNING

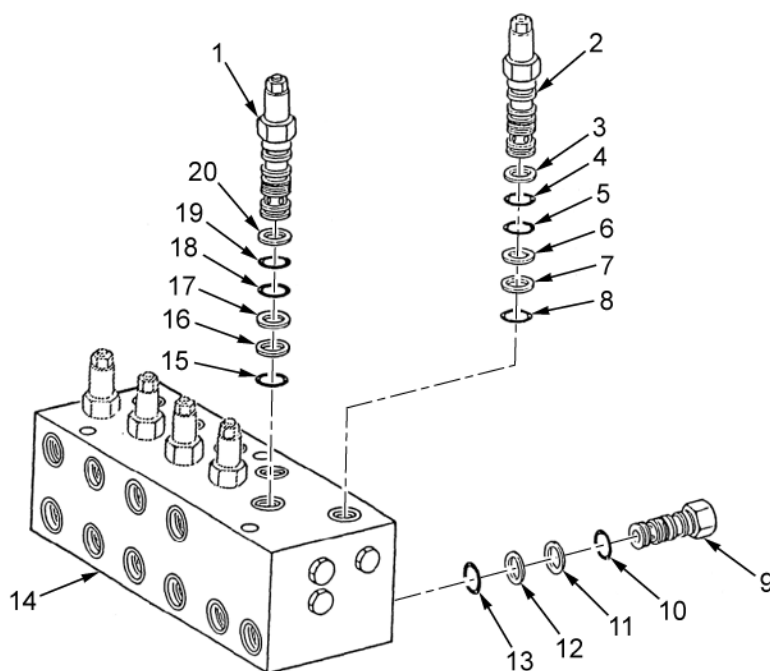
Cleaning compound solvent is used to clean parts and is potentially dangerous to personnel. Extinguish all smoking materials and do not allow sparks or open flame near the work area. Use skin and eye protection and work in a well-ventilated area. Failure to follow this warning may result in injury to personnel.

7. Clean all tubes, fittings, attaching hardware, suspension control manifold and cartridge, and flow regulating valves in degreaser tank with cleaning compound solvent.
8. Inspect cartridge and flow regulating valves for pitting, cracks, and wear. If defective, replace parts as required.

WARNING

Compressed air used for cleaning/drying may create airborne particles that may injure the eyes. Always wear eye protection. Pressure must not exceed 30 psi (207 kPa) or injury to personnel may result.

9. Inspect all ports and openings in suspension control manifold and cartridge and flow regulating valves for foreign objects, dirt, and clogged passageways. Use compressed air to clear clogged passageways.
10. Inspect all hydraulic tubes removed for kinks, pin hole leaks, pitted and split flares, and clogged passageways. Use compressed air to clear clogged passageways. Replace any defective tubes.
11. Pour clean hydraulic fluid into suspension control manifold and cartridge and flow regulating valves to flush out contaminants.
12. Replace all parts found defective and replace all preformed packings (Figure 3, Item 4, Item 5, Item 8, Item 10, Item 13, Item 15, Item 18, and Item 19) and backup rings (Figure 3, Item 3, Item 6, Item 7, Item 11, Item 12, Item 16, Item 17, and Item 20) using respective repair kits.



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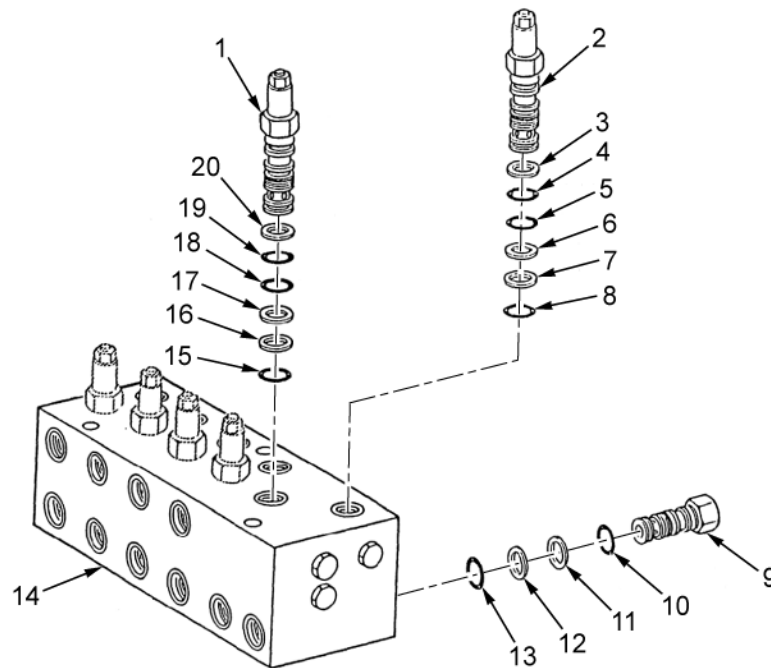
Figure 3. Suspension Control Manifold Repair.

CAUTION

As the flow regulating and cartridge valves are assembled, the arrangement of preformed packings and backup rings is extremely important. If the preformed packing and backup rings are improperly installed, internal leakage or premature equipment failure may result. Use the illustration shown in Figure 4 for proper arrangement of parts.

13. Apply petroleum jelly to new preformed packings (Figure 4, Item 13 and Item 10) and new backup rings (Figure 4, Item 12 and Item 11).
14. Remove caps/plugs and install new preformed packing (Figure 4, Item 10), new backup rings (Figure 4, Item 12 and Item 11), and new preformed packing (Figure 4, Item 13) onto FCCB XAN flow regulating valve (Figure 4, Item 9). Repeat this step as required for all FCCB XAN flow regulating valves.
15. Remove caps/plugs and align and install four FCCB XAN flow regulating valves (Figure 4, Item 9) into suspension manifold (Figure 4, Item 14).
16. Apply petroleum jelly to new preformed packings (Figure 4, Item 8, Item 5, and Item 4) and new backup rings (Figure 4, Item 7, Item 6, and Item 3).
17. Install new backup ring (Figure 4, Item 3), new preformed packings (Figure 4, Item 4 and Item 5), new backup rings (Figure 4, Item 6 and Item 7), and new preformed packing (Figure 4, Item 8) onto CBCA LAN cartridge valve (Figure 4, Item 2).
18. Remove caps/plugs and align and install CBCA LAN cartridge valve (Figure 4, Item 2) into suspension manifold (Figure 4, Item 14).
19. Apply petroleum jelly to new preformed packings (Figure 4, Item 15, Item 18, and Item 19) and new backup rings (Figure 4, Item 16, Item 17, and Item 20).
20. Install new backup ring (Figure 4, Item 20), new preformed packings (Figure 4, Item 19 and Item 18), new backup rings (Figure 4, Item 17 and Item 16), and new preformed packing (Figure 4, Item 15) onto CBCG LCN cartridge valve (Figure 4, Item 1). Repeat this step as required for all CBCG LCN cartridge valves.

21. Remove caps/plugs and align and install five CBCG LCN cartridge valves (Figure 4, Item 1) into suspension manifold (Figure 4, Item 14).



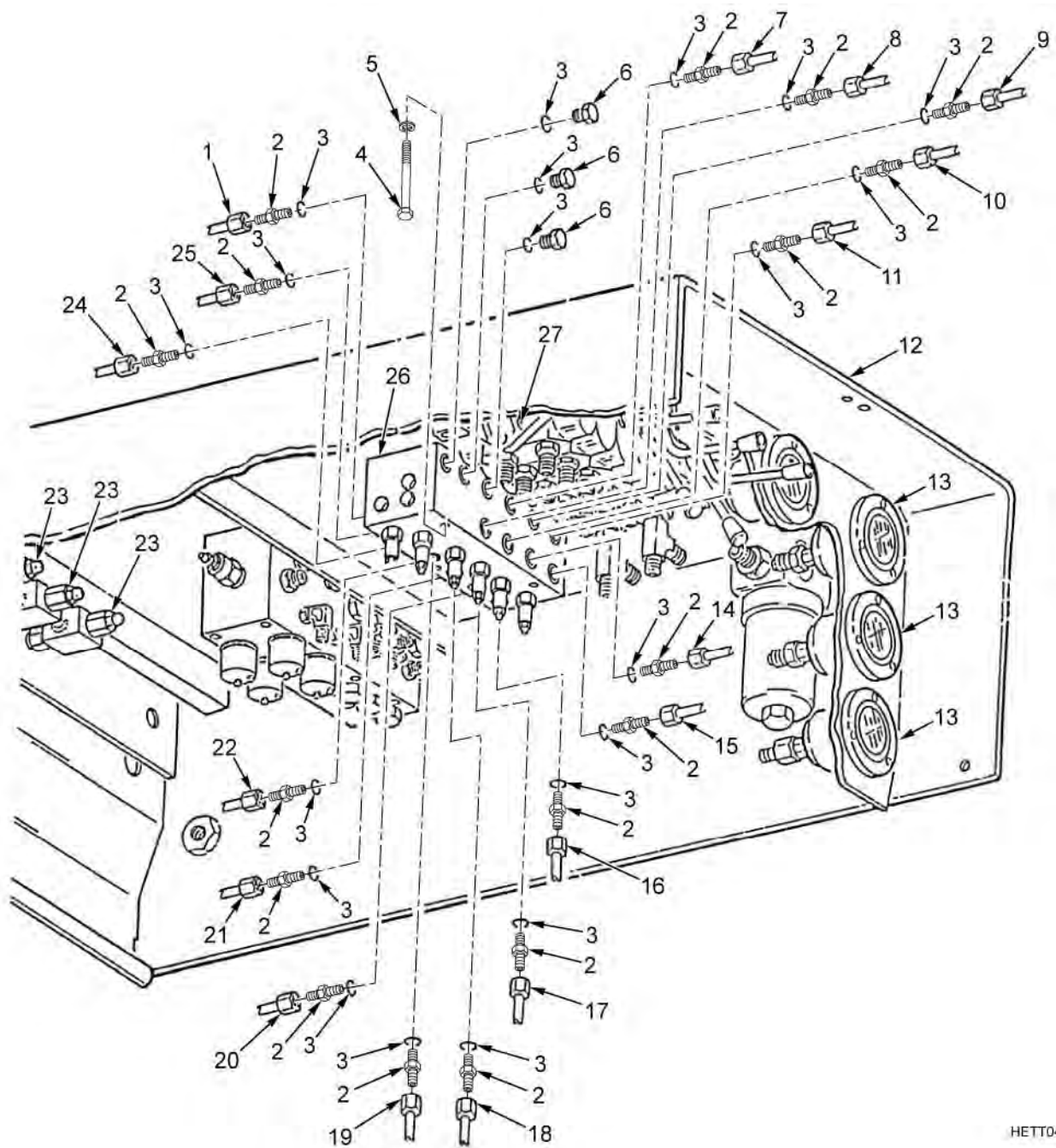
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Figure 4. Suspension Control Manifold Repair.

END OF TASK

INSTALLATION

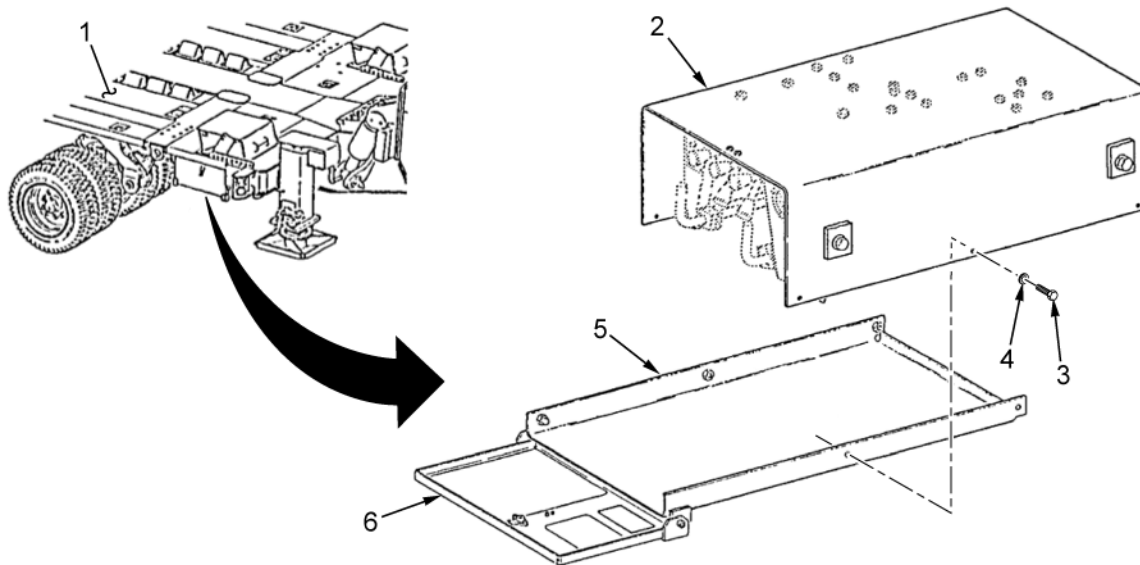
1. Apply petroleum jelly to twenty new preformed packings (Figure 5, Item 3). Install seventeen new preformed packings onto seventeen straight pipe-to-tube adapters (Figure 5, Item 2). Install three preformed packings onto three tube fitting plugs (Figure 5, Item 6).
2. Remove caps/plugs installed and install three tube fitting plugs (Figure 5, Item 6) into suspension control manifold (Figure 5, Item 26).
3. Remove caps/plugs installed and install seventeen straight pipe-to-tube adapters (Figure 5, Item 2) into suspension control manifold (Figure 5, Item 26).
4. Use one person to align and support suspension control manifold (Figure 5, Item 26) with hydraulic control module frame (Figure 5, Item 12).
5. With first person holding suspension control manifold (Figure 5, Item 26), use a second person to install three capscrews (Figure 5, Item 4) and lockwashers (Figure 5, Item 5).
6. Remove caps/plugs installed into three hydraulic tubes (Figure 5, Item 11, Item 9, and Item 7). Use two wrenches to install three hydraulic tubes, between three straight pipe-to-tube adapters (Figure 5, Item 2), on suspension control manifold (Figure 5, Item 26) and fittings on three pressure gauges (Figure 5, Item 13).
7. Remove caps/plugs installed into four hydraulic tubes (Figure 5, Item 8, Item 10, Item 14, and Item 15). Install four hydraulic tubes, between four straight pipe-to-tube adapters (Figure 5, Item 2), on suspension control manifold (Figure 5, Item 26) and fittings on four-way directional control valve bank (Figure 5, Item 27).
8. Remove caps/plugs installed into hydraulic tube (Figure 5, Item 1). Install hydraulic tube between straight pipe-to-tube adapter (Figure 5, Item 2) on suspension control manifold (Figure 5, Item 26) and bulkhead fitting on back of hydraulic control module frame (Figure 5, Item 12).
9. Remove caps/plugs installed into five hydraulic tubes (Figure 5, Item 25, Item 24, Item 22, Item 21, and Item 20). Install four hydraulic tubes between five straight pipe-to-tube adapters (Figure 5, Item 2) on suspension control manifold (Figure 5, Item 26) and fittings on suspension shutoff valve (Figure 5, Item 23).
10. Remove caps/plugs installed into four hydraulic tubes (Figure 5, Item 16, Item 17, Item 18, and Item 19). Install four hydraulic tubes between four straight pipe-to-tube adapters (Figure 5, Item 2) on suspension control manifold (Figure 5, Item 26) and fittings on four-way directional control valve bank (Figure 5, Item 27).
11. Align and install handle of suspension shutoff valve and clamp block back into place on hydraulic control module (WP 0115).



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Figure 5. Suspension Control Manifold Installation.

12. Use two people to align and install lower panel (Figure 6, Item 5), with door panel (Figure 6, Item 6) attached, onto hydraulic control module (Figure 6, Item 2). Secure lower panel in place by installing six lockwashers (Figure 6, Item 4) and capscrews (Figure 6, Item 3) onto underside of semitrailer and platform (Figure 6, Item 1).



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Figure 6. Suspension Control Manifold Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Perform hydraulic system check/fill and refill hydraulic tank (WP 0039).

Adjust platform height through several cycles and check for proper operation (WP 0008).

Bleed air from hydraulic system (WP 0041).

END OF WORK PACKAGE

FIELD MAINTENANCE**LINE FRACTURE VALVE**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)

Petroleum Jelly (WP 0170, Item 21)

Lockwasher (4)

Preformed Packing (1)

Equipment Conditions

If repairing a gooseneck cylinder line fracture valve, proceed as follows: Tractor and semitrailer coupled to support gooseneck (WP 0013)

Gooseneck and suspension shutoff valve handles pulled out to ADJUST position (WP 0004)

Hydraulic hoses and fittings removed from line fracture valve (WP 0121)

If repairing a suspension cylinder line fracture valve, proceed as follows: Gooseneck and suspension shutoff valve handles pulled out to ADJUST position (WP 0004) Suspension cylinder disconnected from upper suspension arm (WP 0066)

Suspension hoses unscrewed and removed from line fracture valve (WP 0066)

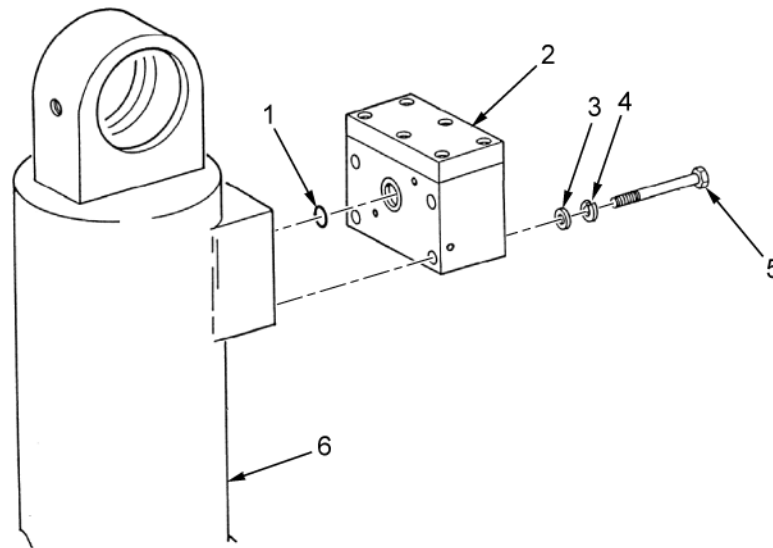
GENERAL INFORMATION

This work package contains instructions for the removal and installation of the line fracture valve.

REMOVAL

WARNING

- Hydraulic fluid may be hot if system has been in operation. Allow time for system to cool before performing maintenance or injury to personnel may result.
 - Hydraulic fluid may be absorbed through the skin. Wear long sleeves and gloves or goggles. If hydraulic fluid gets into the eyes, flush them immediately with water and seek medical attention. If hydraulic fluid gets on skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking. Failure to follow this warning may result in injury to personnel.
1. Remove four capscrews (Figure 1, Item 5), lockwashers (Figure 1, Item 4), washers (Figure 1, Item 3), line fracture valve (Figure 1, Item 2), and preformed packing (Figure 1, Item 1) from cylinder (Figure 1, Item 6). Discard lockwashers and preformed packing. Install plug into back of line fracture valve.



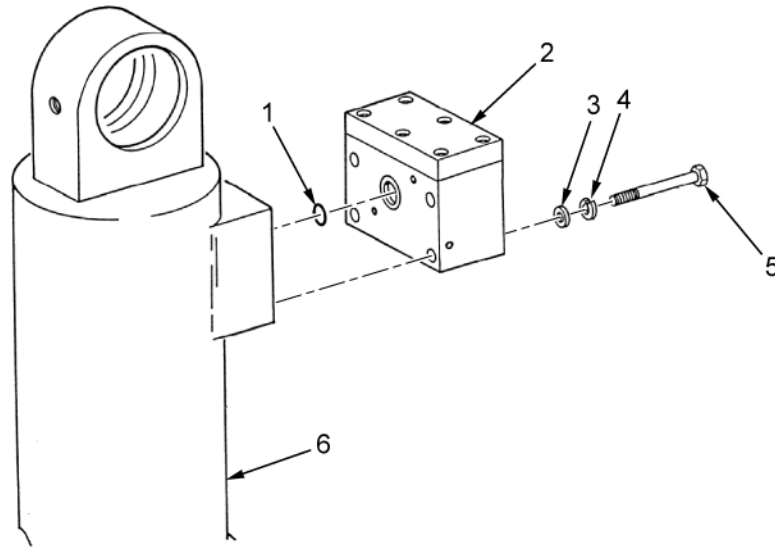
HETT0492

Figure 1. Line Fracture Valve Removal.

END OF TASK

INSTALLATION

1. Lubricate new preformed packing (Figure 2, Item 1) with petroleum jelly.
2. Remove plug and install new preformed packing (Figure 2, Item 1) onto back of line fracture valve (Figure 2, Item 2).
3. Align line fracture valve (Figure 2, Item 2) with cylinder (Figure 2, Item 6) and secure with four capscrews (Figure 2, Item 5), new lockwashers (Figure 2, Item 4), and washers (Figure 2, Item 3).



HETT0492

Figure 2. Line Fracture Valve Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

If a repair was made to gooseneck cylinder line fracture valve, reconnect hydraulic hoses/fittings to cylinders (WP 0121). Uncouple tractor from semitrailer (WP 0066). Operate gooseneck (WP 0007) and check for proper operation.

If a repair was made to a suspension cylinder line fracture valve, install suspension cylinder and hydraulic hoses onto upper suspension arm (WP 0066). Adjust platform height (WP 0008). Check for proper operation.

END OF WORK PACKAGE

FIELD MAINTENANCE**VALVE HANDLES**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)

Equipment ConditionsFront access panel on hydraulic control module lowered
(WP 0004)**Materials/Parts**

Cotter Pin (6) (Configuration A only)

Personnel Required1

GENERAL INFORMATION

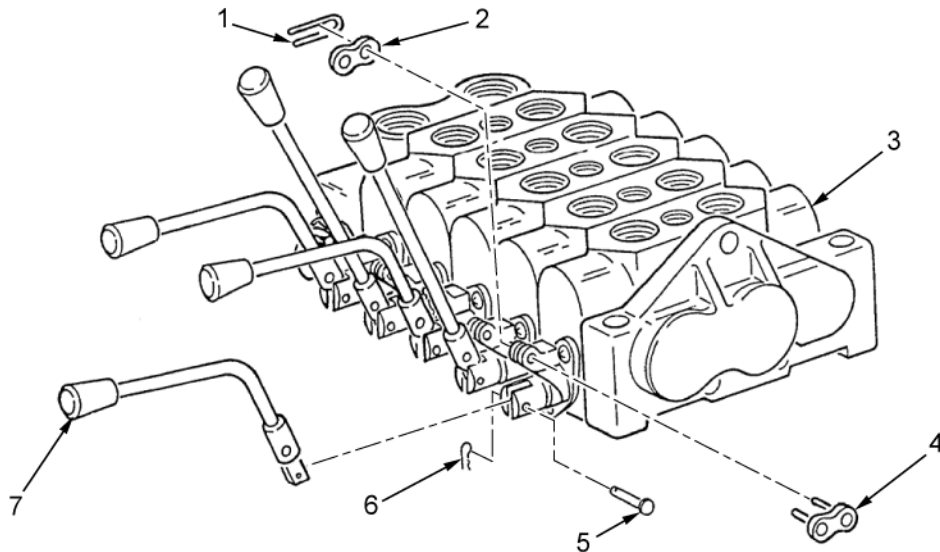
This work package contains instructions for the removal and installation of the valve handles.

REMOVAL**NOTE**

There are two configurations of valve handles on the semitrailers, configuration A and configuration B. These handles are not interchangeable between configurations.

Configuration A

1. Remove link key (Figure 1, Item 1), link plate (Figure 1, Item 2), and link (Figure 1, Item 4) from valve body (Figure 1, Item 3) and valve handle (Figure 1, Item 7).
2. Remove cotter pin (Figure 1, Item 6), shouldered pin (Figure 1, Item 5), and valve handle (Figure 1, Item 7) from valve body (Figure 1, Item 3). Discard cotter pin.
3. Repeat steps 1 and 2 as required for each valve handle (Figure 1, Item 7) to be removed.
4. Inspect valve handles (Figure 1, Item 7) for cracks, wear, and corrosion. If corroded, clean as required. If defective, replace as required.



HETT0493

Figure 1. Configuration A Valve Handle Removal.

Configuration B

1. Push back on ears of clip (Figure 2, Item 2) and unsnap from clevis (Figure 2, Item 4).
2. Remove clip (Figure 2, Item 2), pin (Figure 2, Item 3), and handles (Figure 2, Item 5) from valve (Figure 2, Item 1).
3. Inspect valve handles (Figure 2, Item 5) for cracks, wear, and corrosion. If corroded, clean as required. If defective, replace as required.

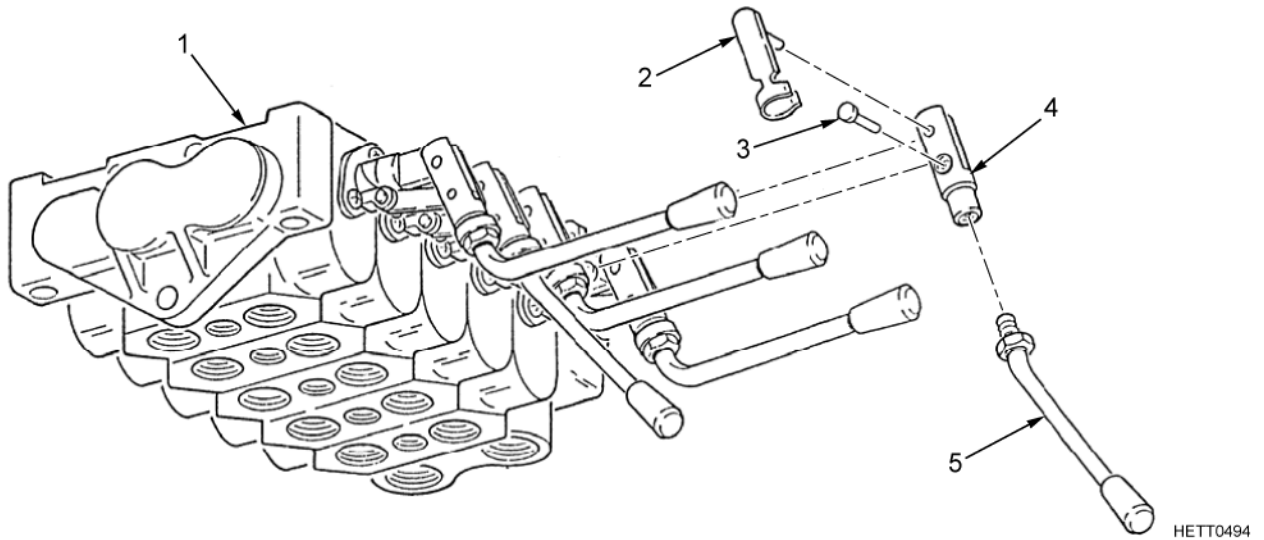


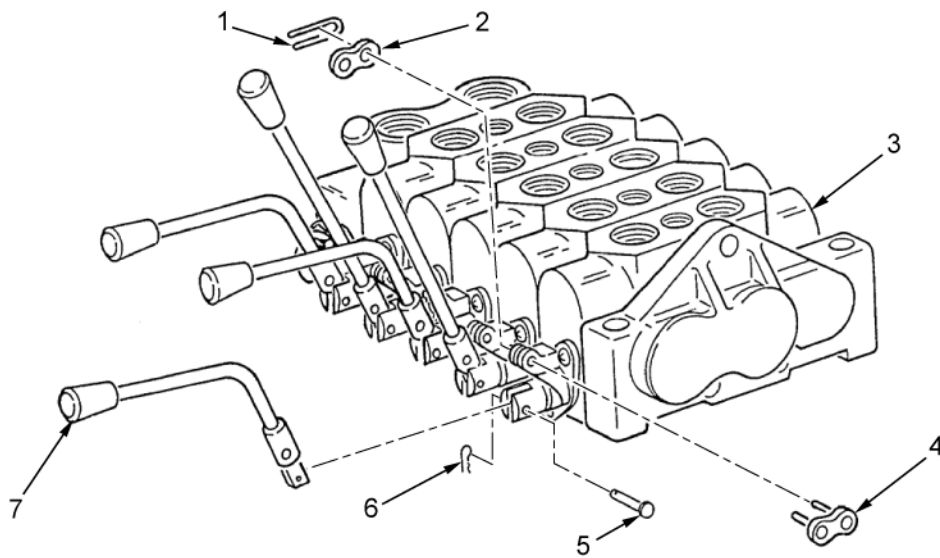
Figure 2. Configuration B Valve Handle Removal.

END OF TASK

INSTALLATION**Configuration A****NOTE**

There are two configurations of valve handles on the semitrailers, configuration A and configuration B. These handles are not interchangeable between configurations.

1. Align valve handle (Figure 3, Item 7) with valve body (Figure 3, Item 3) and secure with shouldered pin (Figure 3, Item 5) and cotter pin (Figure 3, Item 6).
2. Install link (Figure 3, Item 4) to valve body (Figure 3, Item 3) and valve handle (Figure 3, Item 7). Secure link in place by installing link plate (Figure 3, Item 2) and link key (Figure 3, Item 1).
3. Repeat steps 1 and 2 as required for each valve handle (Figure 3, Item 7) to be installed.



HETT0493

Figure 3. Configuration A Valve Handle Installation.

Configuration B

1. Install handle (Figure 4, Item 5) to valve (Figure 4, Item 1) and insert pin (Figure 4, Item 3) into side of clevis (Figure 4, Item 4) with head of pin in recess in clevis.
2. Insert pin (Figure 4, Item 3), and then clip (Figure 4, Item 2) into clevis (Figure 4, Item 4) and rotate clip until ears on pin snap in place on clevis and capture pin.

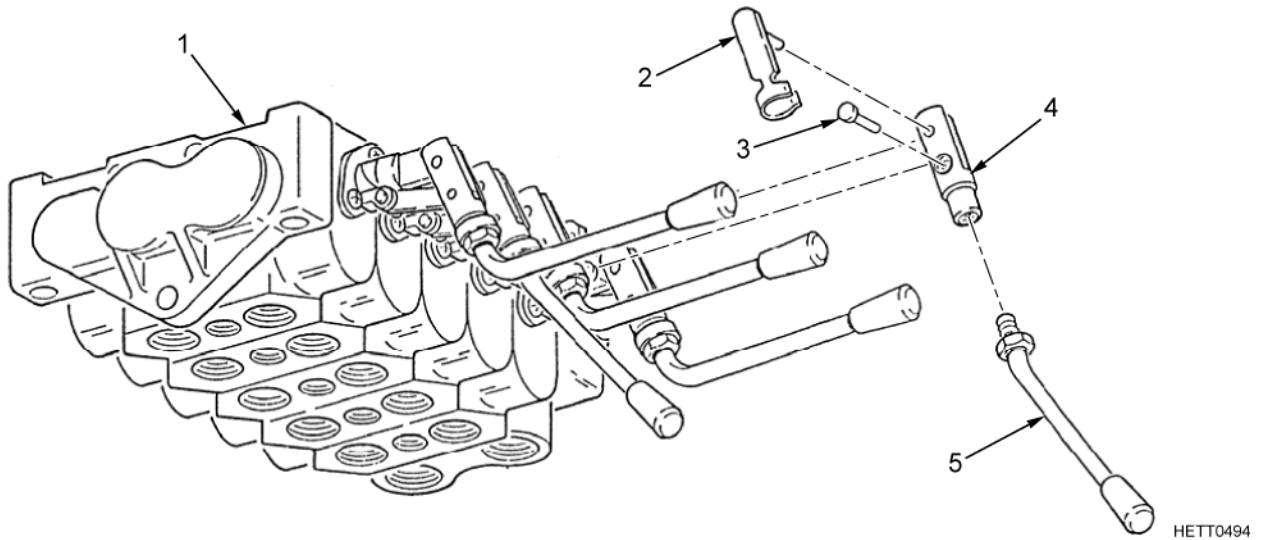


Figure 4. Configuration B Valve Handle Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Operate valve handles and check for proper operation (WP 0004).

END OF WORK PACKAGE

FIELD MAINTENANCE
SUSPENSION ISOLATION VALVE ASSEMBLY

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)

Equipment Conditions

Suspension isolation valve assembly removed (WP 0124)

Personnel Required

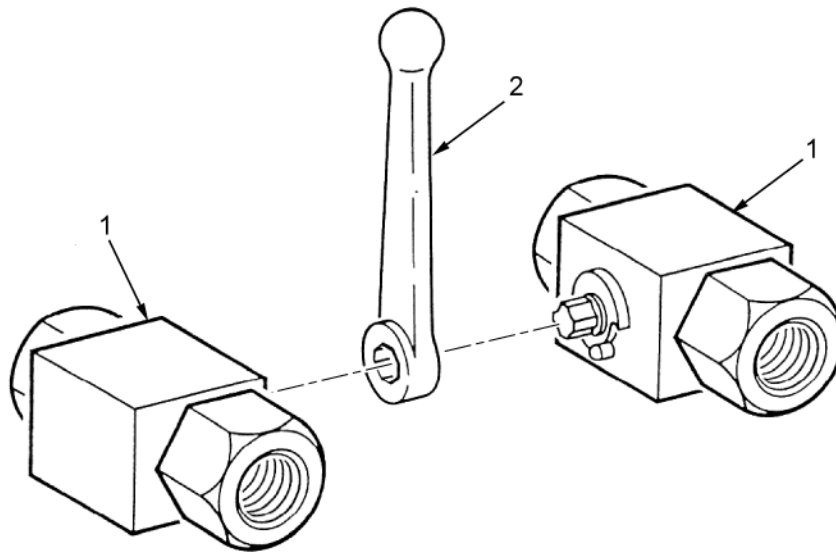
1

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the suspension isolation valve.

REMOVAL

1. Separate two suspension isolation ball valves (Figure 1, Item 1) and remove valve handle (Figure 1, Item 2).
2. Inspect two suspension isolation ball valves (Figure 1, Item 1) and valve handle (Figure 1, Item 2) for cracks, wear, and corrosion. Replace defective parts as required.



HETT0495

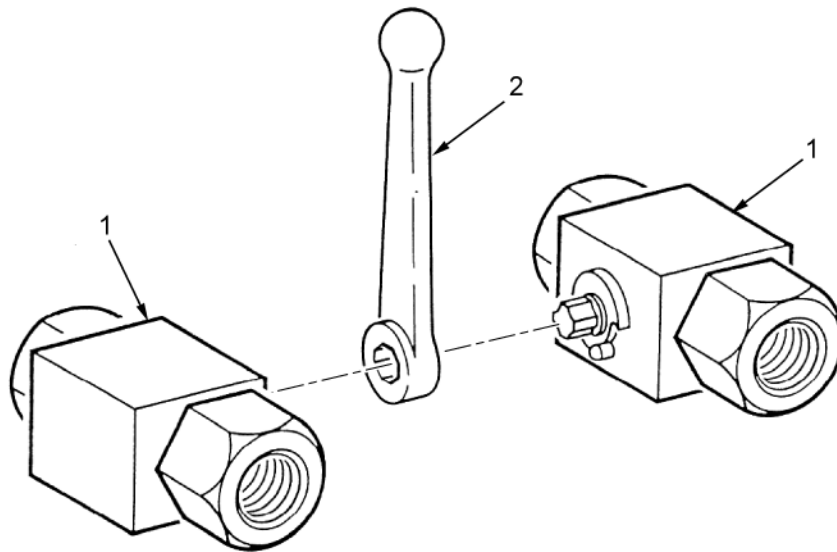
Figure 1. Suspension Isolation Valve Assembly Removal.

END OF TASK

INSTALLATION**CAUTION**

The ball valves must be arranged so that both ball valves operate in the same direction or damage to equipment may result.

1. Place two suspension isolation ball valves (Figure 2, Item 1) so that valve stems face each other. Ensure both valves are closed. Close one of the suspension isolation ball valves, if necessary, so that both valves are the same and will operate in the same direction by valve handle (Figure 1, Item 2).
2. Align valve handle (Figure 1, Item 2) so that valve handle is parallel between two suspension isolation ball valves (Figure 1, Item 1) and push two suspension isolation ball valves into valve handle.



HETT0495

Figure 2. Suspension Isolation Valve Assembly Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Ensure suspension isolation valve assembly is installed and hydraulic lines and fittings are reconnected to valve assembly (WP 0124).

Operate suspension isolation valve handle and check for proper operation (WP 0004).

END OF WORK PACKAGE

FIELD MAINTENANCE
SUSPENSION SHUTOFF VALVE ASSEMBLY

INITIAL SETUP:**Tools and Special Tools**

Handle, Ext, SPNSN ISOL Valve (WP 0168, Item 1)
General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Locknut (5)
Preformed Packing (10)
Lockwasher (5)

Personnel Required

2

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Hydraulic Fluid (WP 0170, Item 17)
Petroleum Jelly (WP 0170, Item 21)
Solvent, Cleaning Compound (WP 0170, Item 31)
Lockwasher (6)

Equipment Conditions

Platform adjusted to 50 in. (127 cm) height (WP 0008)
All suspension isolation valves closed (WP 0004)
Hydraulic tank drained (WP 0040)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the suspension shutoff valve assembly.

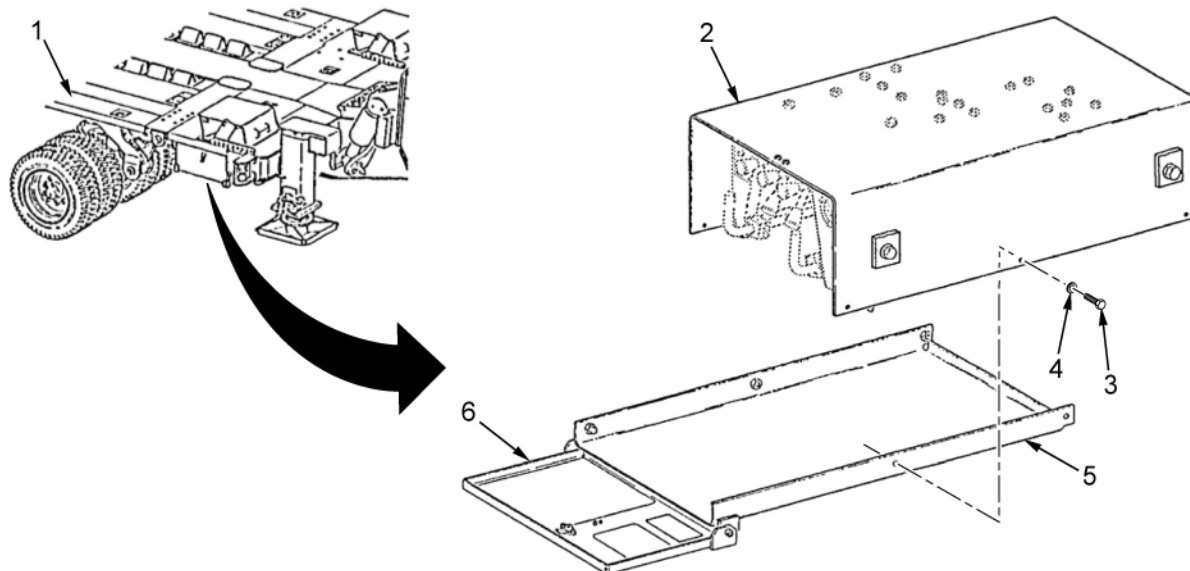
REMOVAL

WARNING

- Hydraulic fluid may be absorbed through the skin. Avoid prolonged exposure to skin and wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into the eyes, flush them immediately with water and seek medical attention. If hydraulic fluid gets on skin, wash thoroughly with soap and water. Wash hands thoroughly prior to eating or smoking.
- Hydraulic fluid may be hot if system has been in operation. Allow time for system to cool before performing maintenance.
- Residual pressure may remain in hydraulic lines; open fittings slowly.

Failure to follow these warnings may result in serious injury or death to personnel.

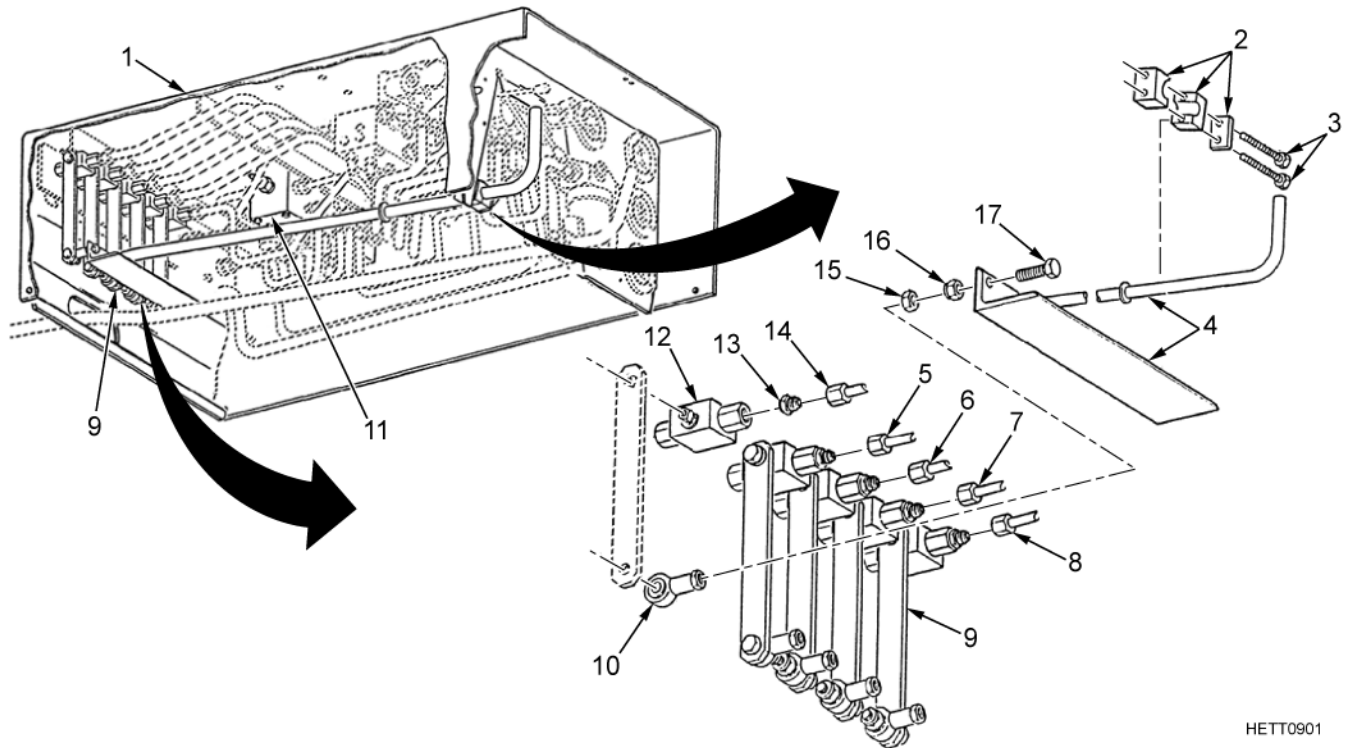
1. Ensure hydraulic control module door panel is lowered (WP 0004).
2. Use two people to remove six capscrews (Figure 1, Item 3), lockwashers (Figure 1, Item 4), and lower panel (Figure 1, Item 5) from hydraulic control module (Figure 1, Item 2). Carefully remove lower panel, with panel door (Figure 1, Item 6) attached, out from under semitrailer and place on platform (Figure 1, Item 1). Discard six lockwashers.



HETT0496

Figure 1. Suspension Shutoff Valve Assembly Removal.

3. Place drain pan under hydraulic control module (Figure 2, Item 1). Tag and disconnect five hydraulic tubes (Figure 2, Item 14, Item 5, Item 6, Item 7, and Item 8) from five straight tube-to-boss adapters (Figure 2, Item 13) attached to five ball valves (Figure 2, Item 12) on suspension shutoff valve (Figure 2, Item 9) and from fittings on suspension control manifold (Figure 2, Item 11). Install caps/plugs into tube openings.
4. Remove five jam nuts (Figure 2, Item 15), locknuts (Figure 2, Item 16), and bolts (Figure 2, Item 17) from valve handle weldment (Figure 2, Item 4) and rod ends (Figure 2, Item 10). Discard locknuts.
5. Remove two bolts (Figure 2, Item 3) and clamp sections (Figure 2, Item 2) from valve handle weldment (Figure 2, Item 4) and hydraulic control module (Figure 2, Item 1).



HETT0901

Figure 2. Suspension Shutoff Valve Assembly Removal.

6. Tag and disconnect five hydraulic tubes (Figure 3, Item 16) from five tube reducers (Figure 3, Item 14) on back side of hydraulic control module (Figure 3, Item 2) between module frame and platform mainbeam (Figure 3, Item 1). Install caps/plugs into tube openings.

CAUTION

The orientation of ball valves on the suspension shutoff valve assembly is important. Each ball valve must be installed back in the proper place and direction, or damage to equipment may result.

7. Remove five tube coupling nuts (Figure 3, Item 15) and tube reducers (Figure 3, Item 14) from straight pipe-to-tube adapters (Figure 3, Item 17). Remove five fitting nuts (Figure 3, Item 13) from straight pipe-to-tube adapters. Document position and flow direction of each ball valve (Figure 3, Item 6) and remove five ball valves with attached parts.
8. Remove capscrew (Figure 3, Item 3), lockwasher (Figure 3, Item 4), washer (Figure 3, Item 5), and actuating lever (Figure 3, Item 11) from ball valve (Figure 3, Item 6). Repeat this step for the four remaining actuating levers. Discard lockwashers.
9. Remove five straight tube-to-boss reducers (Figure 3, Item 8), five straight pipe-to-tube adapters (Figure 3, Item 17), and ten preformed packings (Figure 3, Item 7) from five ball valves (Figure 3, Item 6). Install caps/plugs into openings and discard preformed packings.
10. Remove five locknuts (Figure 3, Item 9) and capscrews (Figure 3, Item 12) from actuating levers (Figure 3, Item 11) and rod ends (Figure 3, Item 10). Discard locknuts.

WARNING



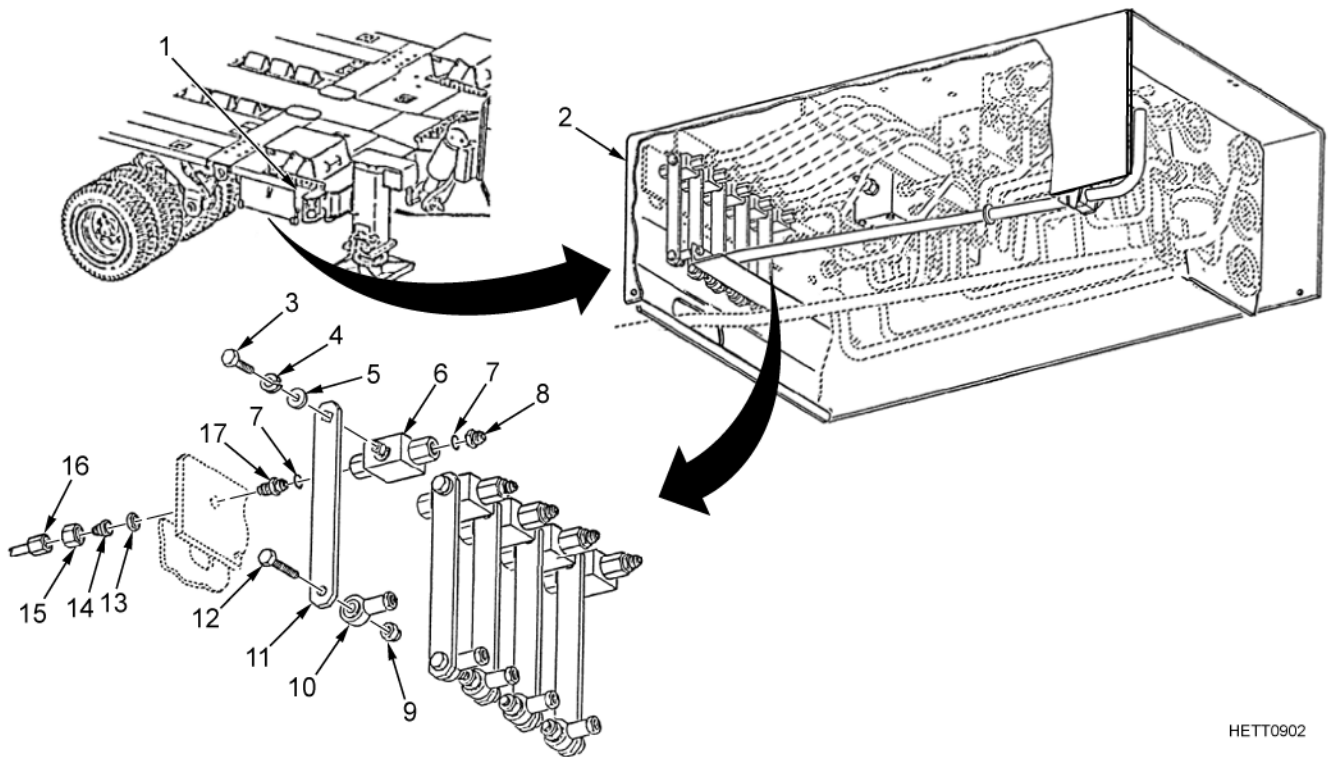
Cleaning compound solvent is used to clean parts and is potentially dangerous to personnel. Extinguish all smoking materials and do not allow sparks or open flame near the work area. Use skin and eye protection and work in a well-ventilated area. Failure to follow this warning may result in serious injury or death to personnel.

11. Clean all tubes, fittings, attaching hardware, and pieces of suspension shutoff valve in degreaser tank with cleaning compound solvent.
12. Inspect each ball valve for pitting, cracks, and wear. If defective, replace parts as required.

WARNING

Compressed air used for cleaning/drying may create airborne particles that may injure the eyes. Always wear eye protection. Pressure must not exceed 30 psi (207 kPa). Failure to follow this warning may result in injury to personnel.

13. Inspect all ports and openings in each ball valve for foreign objects, dirt, and clogged passageways. Use compressed air to clear clogged passageways.
14. Inspect all hydraulic tubes removed for kinks, pin hole leaks, pitted and split flares, and clogged passageways. Use compressed air to clear clogged passageways. Replace any defective tubes.
15. Pour clean hydraulic fluid into each ball valve to flush out contaminants.



HETT0902

Figure 3. Suspension Shutoff Valve Assembly Removal.

END OF TASK

INSTALLATION

1. Align five rod ends (Figure 4, Item 10) with five actuating levers (Figure 4, Item 11). Install five capscrews (Figure 4, Item 12) through actuating levers and rod ends and secure with five locknuts (Figure 4, Item 9).
2. Lubricate ten preformed packings (Figure 4, Item 7) with petroleum jelly. Install five new preformed packings onto five straight pipe-to-tube adapters (Figure 4, Item 17). Install five new preformed packings onto five straight tube-to-boss reducers (Figure 4, Item 8).
3. Remove caps/plugs installed and install five straight pipe-to-tube adapters (Figure 4, Item 17) and five straight tube-to-boss reducers (Figure 4, Item 8) onto five ball valves (Figure 4, Item 6).

CAUTION

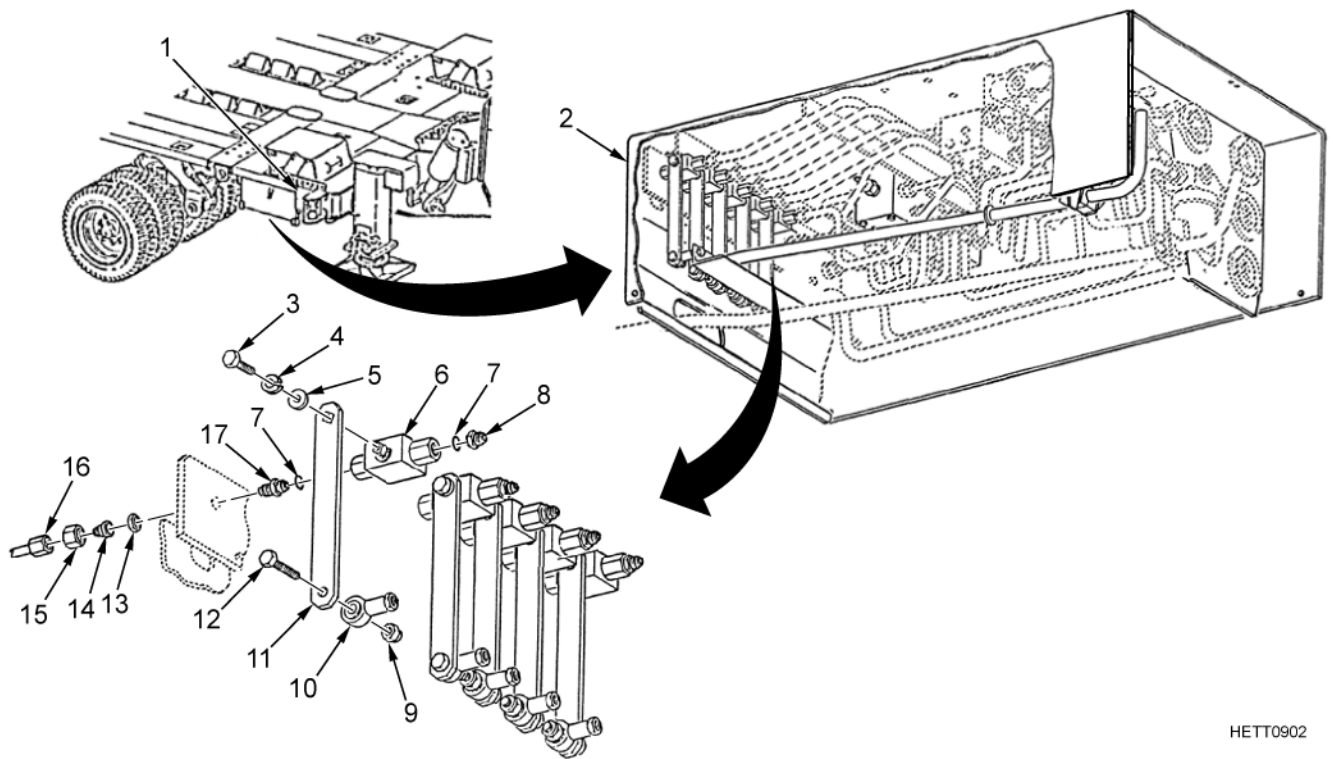
The ball valves must be arranged so that all ball valves operate in the same direction or damage to equipment or premature system failure may result.

4. Check that ball valves (Figure 4, Item 6) are preset with each ball open and arranged so that all valves will close when operated in the same direction.

CAUTION

The actuating levers must be arranged so that all ball valves operate in the same direction, or damage to equipment or premature system failure may result.

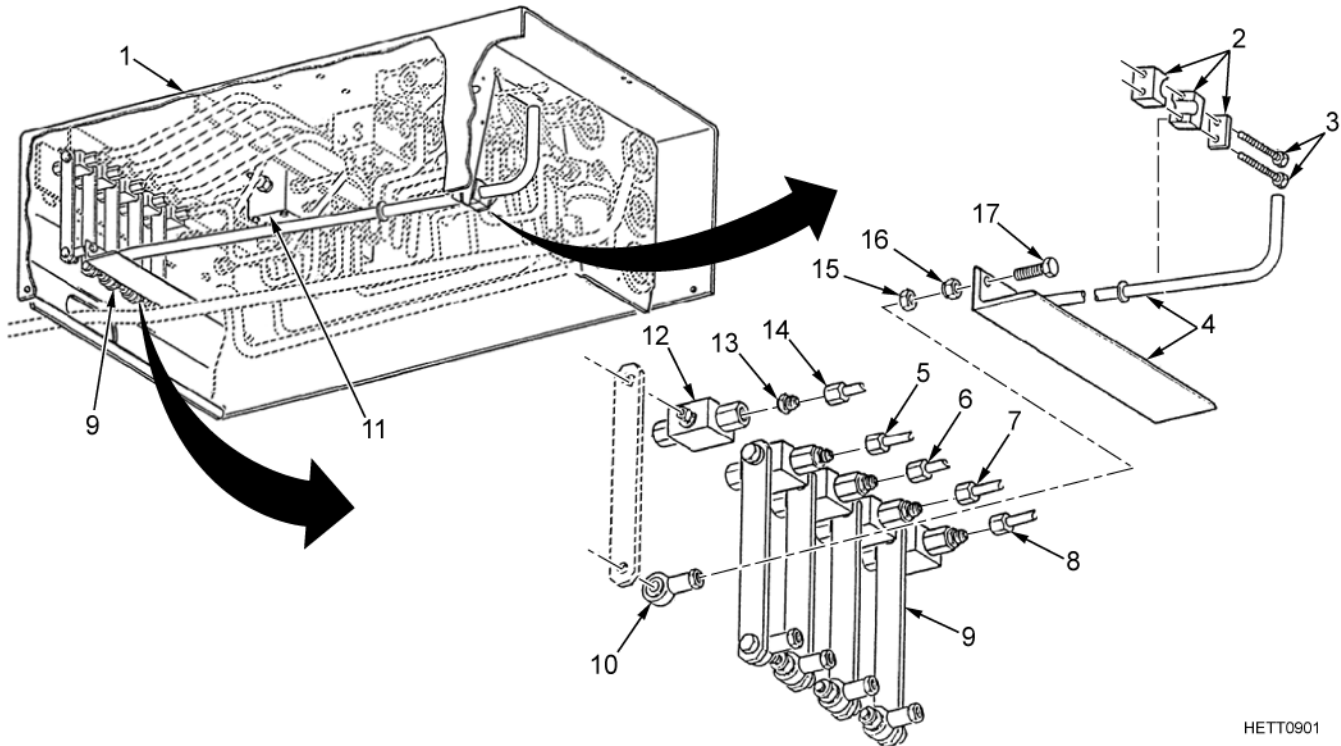
5. Check position of ball in ball valve (Figure 4, Item 6) and install actuating lever (Figure 4, Item 11) onto valve stem on ball valve. Secure each actuating lever in place by installing washer (Figure 4, Item 5), lockwasher (Figure 4, Item 4), and capscrew (Figure 4, Item 3).
6. Align and install five fitting nuts (Figure 4, Item 13), tube reducers (Figure 4, Item 14), and tube coupling nuts (Figure 4, Item 15) onto straight pipe-to-tube adapters (Figure 4, Item 17).
7. Remove caps/plugs installed on five hydraulic tubes (Figure 4, Item 16). Connect five hydraulic tubes onto tube reducers (Figure 4, Item 14) on backside of hydraulic control module (Figure 4, Item 2) between module frame and platform mainbeam (Figure 4, Item 1).



HETT0902

Figure 4. Suspension Shutoff Valve Assembly Installation.

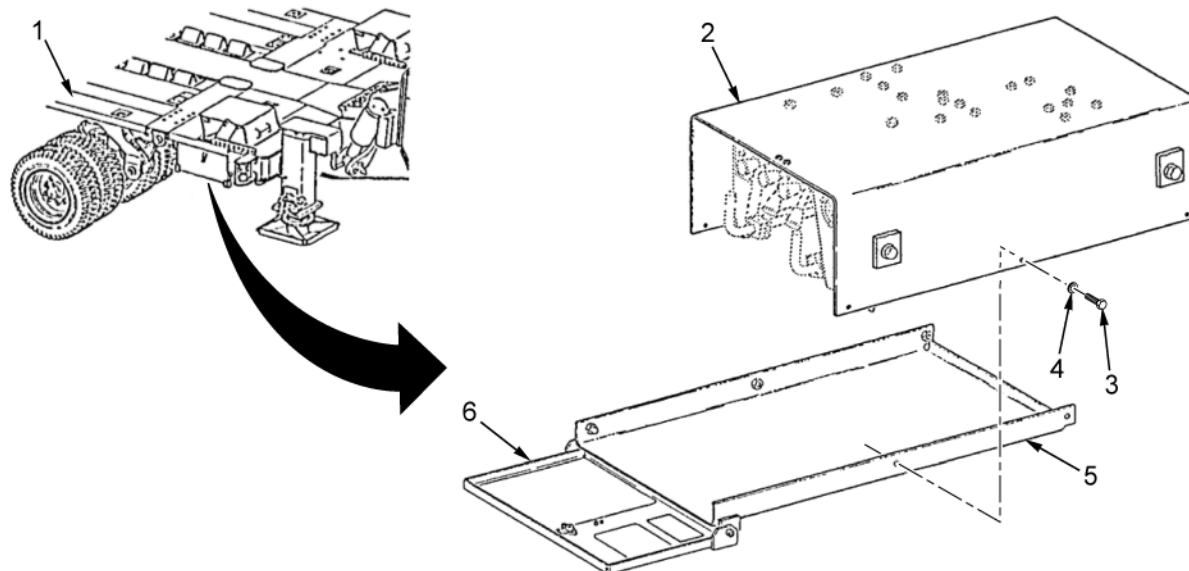
8. Install five bolts (Figure 5, Item 17) into valve handle weldment (Figure 5, Item 4) and secure in place by installing locknuts (Figure 5, Item 16). Thread five jam nuts (Figure 5, Item 15) onto bolts up to and against locknuts.
9. Align clamp sections (Figure 5, Item 2) and valve handle weldment (Figure 5, Item 4) with hydraulic control module (Figure 5, Item 1) and secure in place with two bolts (Figure 5, Item 3).
10. Remove caps/plugs installed on five hydraulic tubes (Figure 5, Item 8, Item 7, Item 6, Item 5, and Item 14). Connect five hydraulic tubes to five straight tube-to-boss adapters (Figure 5, Item 13) and five ball valves (Figure 5, Item 12) on suspension shutoff valve (Figure 5, Item 9) and fittings on suspension control manifold (Figure 5, Item 11).
11. Tighten five jam nuts (Figure 5, Item 15) against rod ends (Figure 5, Item 10).



HETT0901

Figure 5. Suspension Shutoff Valve Assembly Installation.

12. Use two people to align and install lower panel (Figure 6, Item 5), with door panel (Figure 6, Item 6) attached, onto hydraulic control module (Figure 6, Item 2). Secure lower panel in place by installing six lockwashers (Figure 6, Item 4) and capscrews (Figure 6, Item 3) on underside of semitrailer platform (Figure 6, Item 1).



HETT0496

Figure 6. Suspension Shutoff Valve Assembly Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Operate suspension shutoff valve and check for binding (WP 0004).

Adjust platform height and check for proper operation (WP 0008).

Couple tractor/semitrailer (WP 0013) and perform highway driving (WP 0014). Check that suspension operates properly.

END OF WORK PACKAGE

FIELD MAINTENANCE

GOOSENECK ISOLATION VALVE ASSEMBLY

INITIAL SETUP:

Tools and Special Tools

- General Mechanic's Tool Kit (WP 0168, Item 11)
- Standard Army Tool Set (WP 0168, Item 28)

Materials/Parts

- Cap and Plug Set (WP 0170, Item 4)
- Hydraulic Fluid (WP 0170, Item 17)
- Petroleum Jelly (WP 0170, Item 21)
- Solvent, Cleaning Compound (WP 0170, Item 31)
- Cotter Pin (5)
- Self-Locking Bolt (4)
- Preformed Packing (5)

Equipment Conditions

- Front and rear support legs lowered supporting platform (WP 0011 and WP 0012)
- Hydraulic tank drained (WP 0040)
- Except for bulkhead fittings holding each ball valve onto platform, remove all remaining hydraulic lines, fittings, and clamps from gooseneck isolation valve assembly as required (WP 0124)
- Gooseneck isolation valve handle in RUN position (WP 0004)

Personnel Required

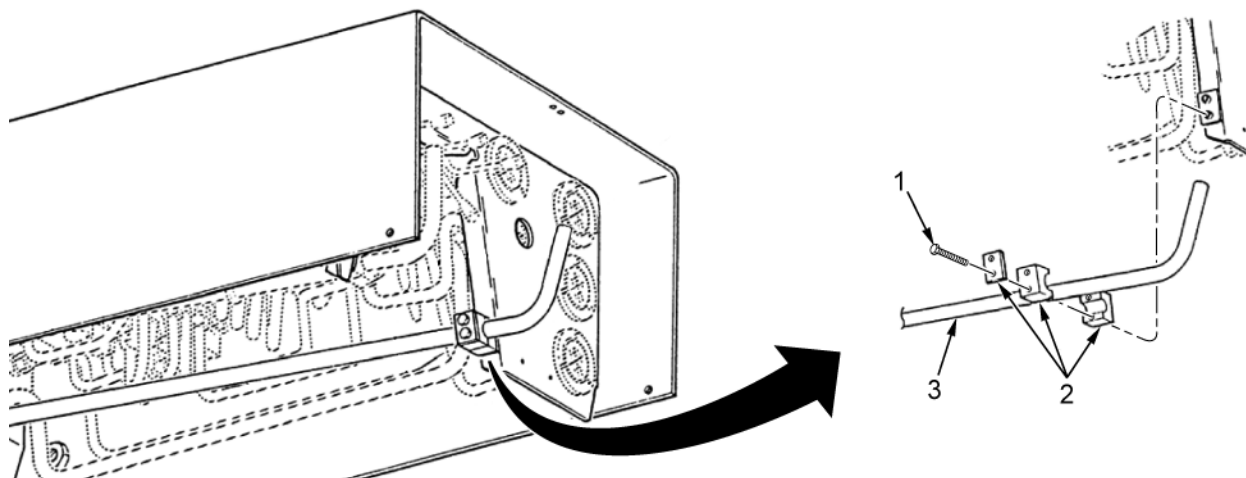
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GENERAL INFORMATION

This work package contains instructions for the removal, repair, and installation of the gooseneck isolation valve assembly.

REMOVAL

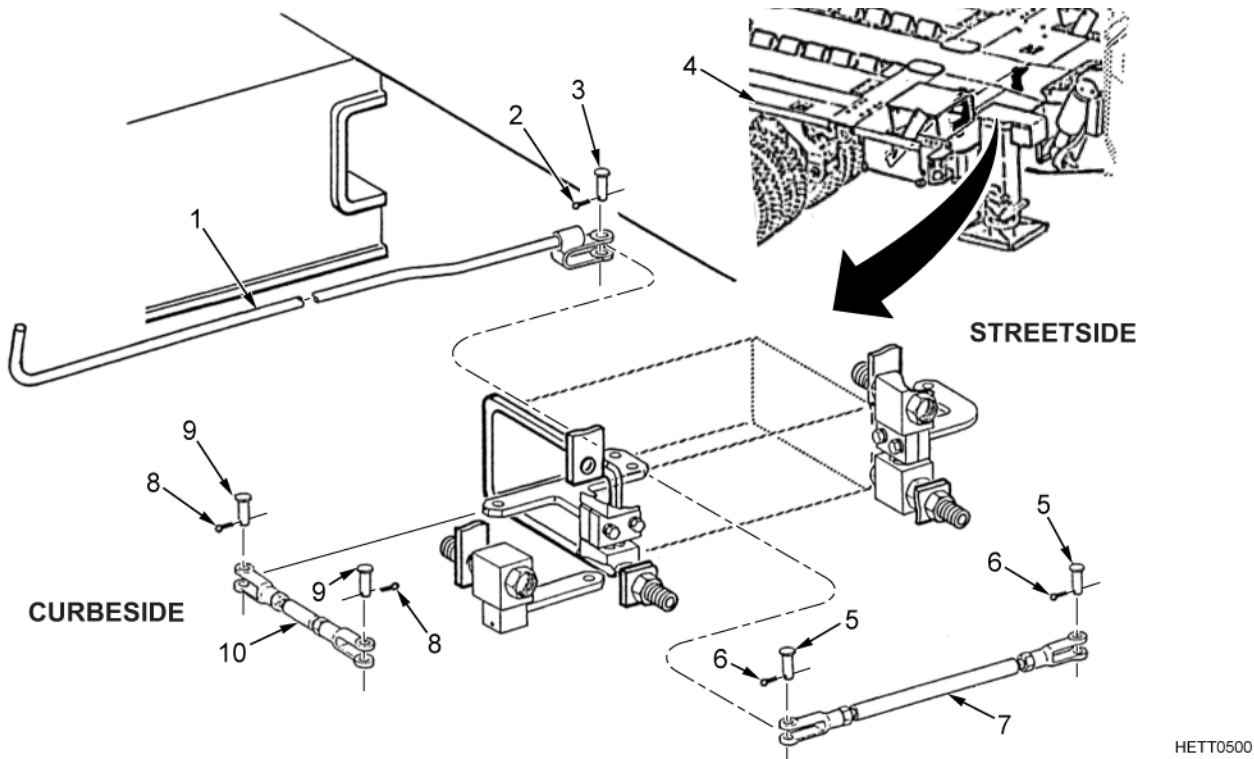
1. Remove two bolts (Figure 1, Item 1) and clamp (Figure 1, Item 2) from manual control lever (Figure 1, Item 3).



HETT0499

Figure 1. Gooseneck Isolation Valve Assembly Removal.

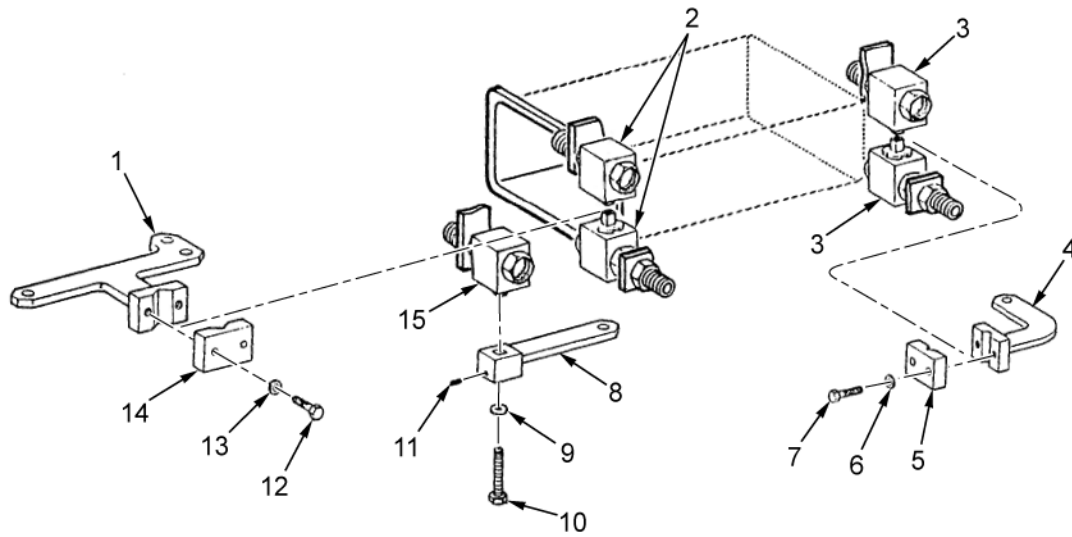
2. Remove cotter pin (Figure 2, Item 2), straight shouldered pin (Figure 2, Item 3), and manual control rod (Figure 2, Item 1) from platform (Figure 2, Item 4). Discard cotter pin.
3. Remove two cotter pins (Figure 2, Item 6), straight shouldered pin (Figure 2, Item 5), and rigid connecting link assembly (Figure 2, Item 7) from platform (Figure 2, Item 4). Discard cotter pins.
4. Remove two cotter pins (Figure 2, Item 8), straight shouldered pin (Figure 2, Item 9), and steering tie rod assembly (Figure 2, Item 10) from platform (Figure 2, Item 4). Discard cotter pins.



HETT0500

Figure 2. Gooseneck Isolation Valve Assembly Removal.

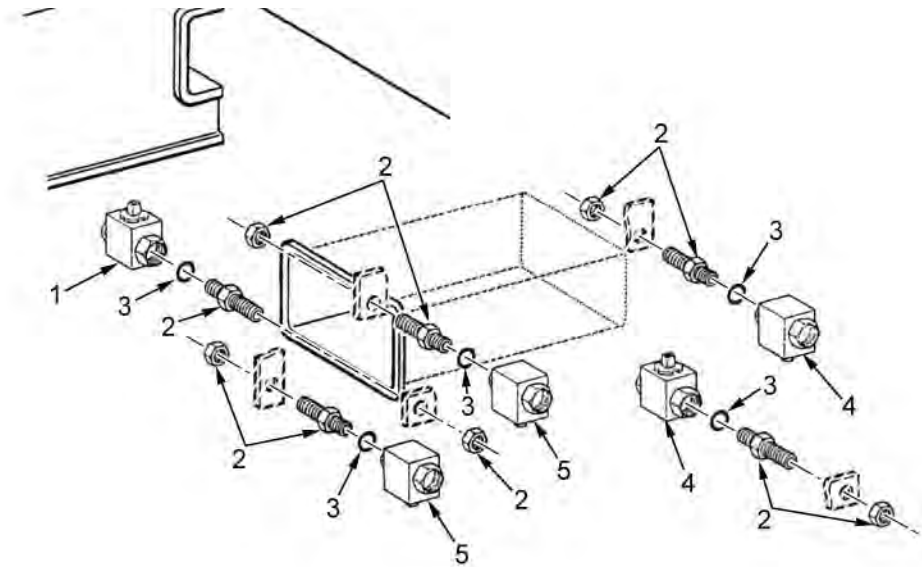
5. Remove two self-locking bolts (Figure 3, Item 12), washers (Figure 3, Item 13), clamp bridge (Figure 3, Item 14), and manual control lever (Figure 3, Item 1) from two ball valves (Figure 3, Item 2). Discard self-locking bolts.
6. Remove capscrew (Figure 3, Item 10), washer (Figure 3, Item 9), and setscrew (Figure 3, Item 11) from manual control lever (Figure 3, Item 8).
7. Use suitable prying device to pry up and remove manual control lever (Figure 3, Item 8) from ball valve (Figure 3, Item 15).
8. Remove two self-locking bolts (Figure 3, Item 7), washers (Figure 3, Item 6), clamp bridge (Figure 3, Item 5), and manual control lever (Figure 3, Item 4) from two ball valves (Figure 3, Item 3). Discard self-locking bolts.



HETT0501

Figure 3. Gooseneck Isolation Valve Assembly Removal.

9. Remove five bulkhead fittings (Figure 4, Item 2) and preformed packings (Figure 4, Item 3) from five ball valves (Figure 4, Item 5, Item 1, and Item 4). Discard preformed packings.



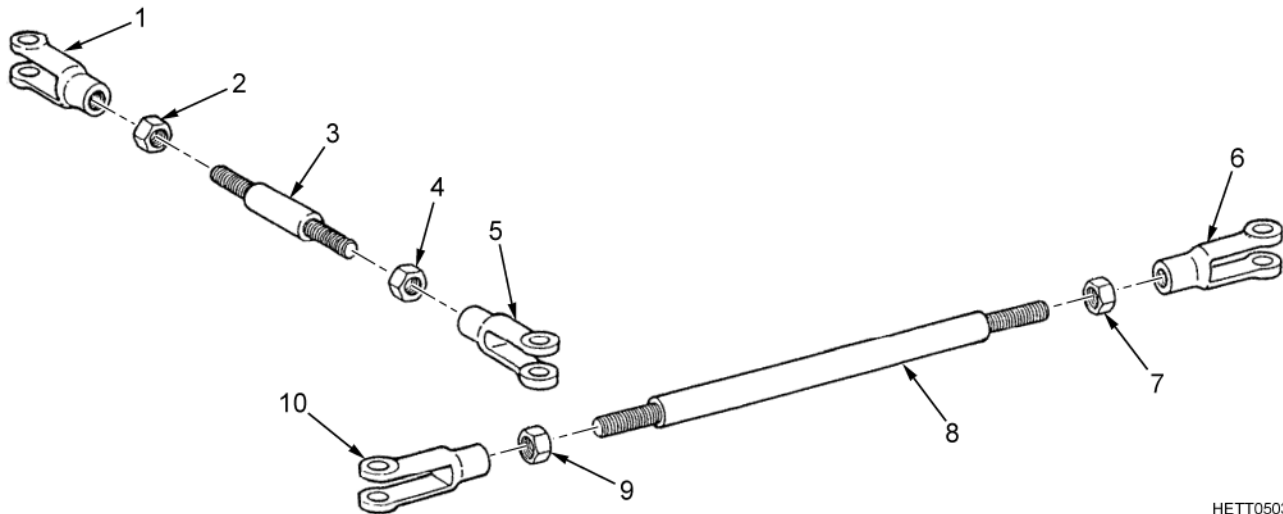
HETT0502

Figure 4. Gooseneck Isolation Valve Assembly Removal.

END OF TASK

REPAIR

1. Count and document number of turns required to remove rod end clevis (Figure 5, Item 1). Loosen jam nut (Figure 5, Item 2) and unscrew and remove rod end clevis from steering tie rod (Figure 5, Item 3).
2. Count and document number of turns required to remove rod end clevis (Figure 5, Item 5). Loosen jam nut (Figure 5, Item 4) and unscrew and remove rod end clevis from steering tie rod (Figure 5, Item 3).
3. Count and document number of turns required to remove rod end clevis (Figure 5, Item 10). Loosen jam nut (Figure 5, Item 9) and unscrew and remove rod end clevis from steering tie rod (Figure 5, Item 8).
4. Count and document number of turns required to remove rod end clevis (Figure 5, Item 6). Loosen jam nut (Figure 5, Item 7) and unscrew and remove rod end clevis from steering tie rod (Figure 5, Item 8).



HETT0503

Figure 5. Gooseneck Isolation Valve Assembly Repair.

WARNING

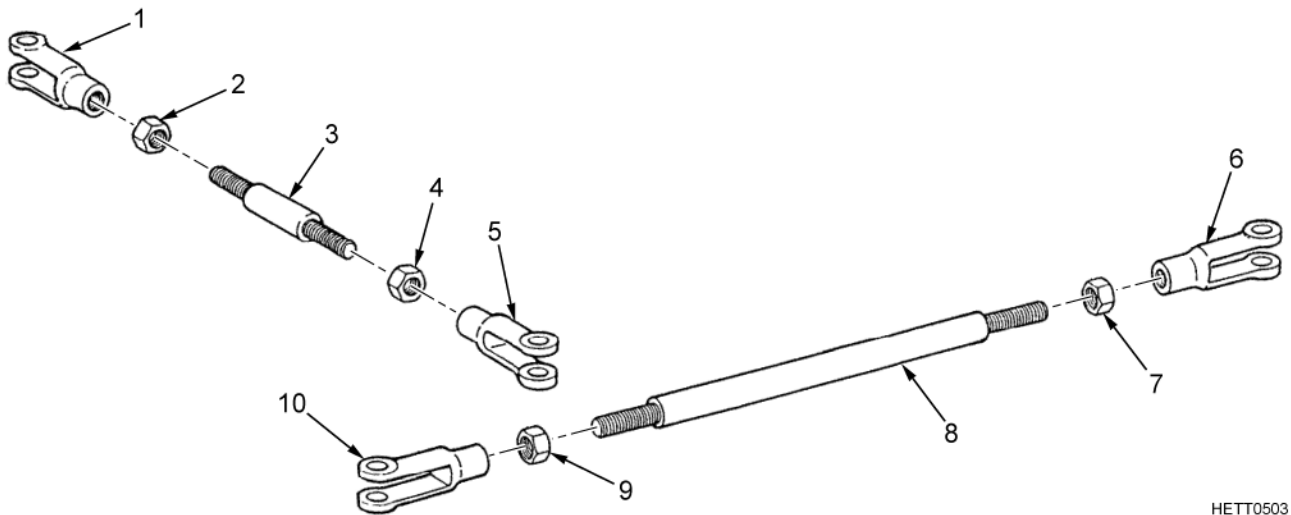
Cleaning compound solvent is used to clean parts and is potentially dangerous to personnel. Extinguish all smoking materials and do not allow sparks or open flame near the work area. Use skin and eye protection and work in a well-ventilated area. Failure to follow this warning may result in injury to personnel.

5. Clean all parts removed in degreaser tank with cleaning compound solvent.
6. Inspect all manual control levers, steering tie rod assembly, rigid connecting link assembly, and all associated parts for cracks, wear, bent levers, and cracked or broken rod end clevis. If any parts are found defective, replace as required.

WARNING

Compressed air used for cleaning/drying may create airborne particles that may injure the eyes. Always wear eye protection. Pressure must not exceed 30 psi (207 kPa) or injury to personnel may result.

7. Inspect openings in ball valves for foreign objects, dirt, and clogged passageways. Use compressed air to clear clogged passageways.
8. Inspect all hydraulic tubes removed for kinks, pin hole leaks, pitted and split flares, and clogged passageways. Use compressed air to clear clogged passageways. Replace any defective tubes.
9. Pour clean hydraulic fluid into ball valves to flush out contaminants.
10. Install jam nut (Figure 6, Item 7) onto steering tie rod (Figure 6, Item 8) and thread jam nut all the way onto steering tie rod.
11. Align and install rod end clevis (Figure 6, Item 6) onto steering tie rod (Figure 6, Item 8) to same number of threads documented during removal. Tighten jam nut (Figure 6, Item 7) against rod end clevis to secure in place.
12. Install jam nut (Figure 6, Item 9) onto steering tie rod (Figure 6, Item 8) and thread jam nut all the way onto steering tie rod.
13. Align and install rod end clevis (Figure 6, Item 10) onto steering tie rod (Figure 6, Item 8) to same number of threads documented during removal. Tighten jam nut (Figure 6, Item 9) against rod end clevis to secure in place.
14. Install jam nut (Figure 6, Item 4) onto steering tie rod (Figure 6, Item 3) and thread jam nut all the way onto steering tie rod.
15. Align and install rod end clevis (Figure 6, Item 5) onto steering tie rod (Figure 6, Item 3) to same number of threads documented during removal. Tighten jam nut (Figure 6, Item 4) against rod end clevis to secure in place.
16. Install jam nut (Figure 6, Item 2) onto steering tie rod (Figure 6, Item 3) and thread jam nut all the way onto steering rod.
17. Align and install rod end clevis (Figure 6, Item 1) onto steering tie rod (Figure 6, Item 3) to same number of threads disconnected during removal. Tighten jam nut (Figure 6, Item 2) against rod end clevis to secure in place.



HETT0503

Figure 6. Gooseneck Isolation Valve Assembly Repair.

END OF TASK

INSTALLATION

1. Lubricate five new preformed packings (Figure 7, Item 3) with petroleum jelly. Install five new preformed packings onto five bulkhead fittings (Figure 7, Item 2).

NOTE

Be sure to check the direction in which the ball valve is to be placed on the platform to ensure the bulkhead will be installed on the proper side of the ball valve.

2. Install five bulkhead fittings (Figure 7, Item 2), preformed packing side first, into five ball valves (Figure 7, Item 4, Item 1, and Item 5).

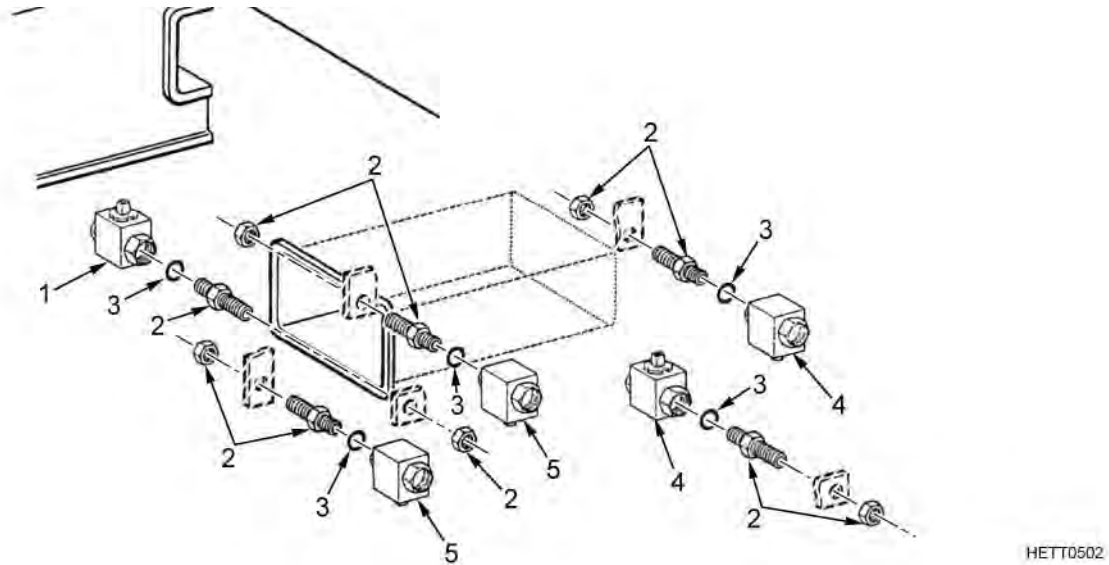


Figure 7. Gooseneck Isolation Valve Assembly Installation.

CAUTION

The ball valves must be arranged so that all ball valves operate in the same direction or damage to equipment or premature system failure may result.

3. Check that all five ball valves (Figure 8, Item 4, Item 18, and Item 5) are set with each ball in open position.
4. Align and install five ball valves (Figure 8, Item 5, Item 18, and Item 4) onto platform weldment (Figure 8, Item 3), passing five bulkhead fittings to platform mounting plates (Figure 8, Item 6). Hand-tighten jam nut on each of five bulkhead fittings (Figure 8, Item 2) so that ball valves can move slightly.
5. Align manual control lever (Figure 8, Item 7) and clamp bridge (Figure 8, Item 8) between two ball valves (Figure 8, Item 5) and secure in place by installing two washers (Figure 8, Item 9) and self-locking bolts (Figure 8, Item 10).

NOTE

Check position of each ball valve by looking through one of the ports on the valve as the valves are operated.

6. Operate manual control lever (Figure 8, Item 7) and check that ball in each ball valve (Figure 8, Item 5) is moving the same amount and in the same direction.
 - a. If each ball in ball valves (Figure 8, Item 5) works properly, tighten down nut on each bulkhead fitting (Figure 8, Item 2) for both ball valves.
 - b. If each ball in ball valves does not work properly, refer to repair steps and remove valve. Then align and install ball valves (Figure 8, Item 5) until valves work properly.

7. Install manual control lever (Figure 8, Item 11) onto ball valve (Figure 8, Item 18). Secure manual control lever in place by installing setscrew (Figure 8, Item 14), washer (Figure 8, Item 12), and capscrew (Figure 8, Item 13).

NOTE

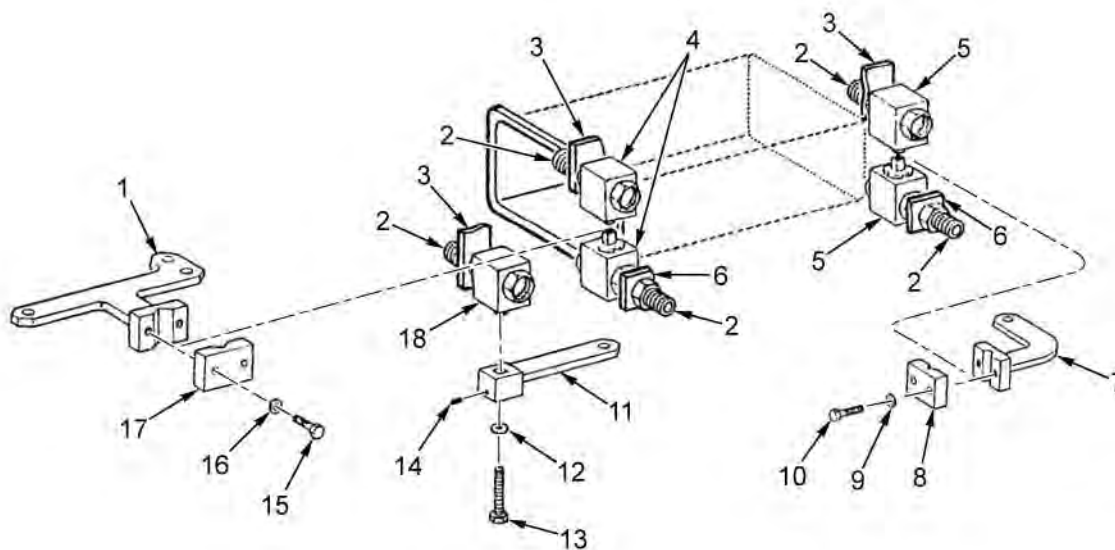
Check position of ball valve by looking through one of the ports on the valve as the valve is operated.

8. Operate manual control lever (Figure 8, Item 11) and check that ball in ball valve (Figure 8, Item 18) is moving in proper direction.
 - a. If ball in ball valve (Figure 8, Item 18) works properly, tighten down nut on bulkhead fitting (Figure 8, Item 2) for ball valves.
 - b. If each ball in ball valves does not work properly, refer to repair steps and remove valve. Then, align and install ball valves (Figure 8, Item 18) until valves work properly.
9. Align manual control lever (Figure 8, Item 1) and clamp bridge (Figure 8, Item 17) between two ball valves (Figure 8, Item 4) and secure in place by installing two washers (Figure 8, Item 16) and self-locking bolts (Figure 8, Item 15).

NOTE

Check position of each ball valve by looking through one of the ports on the valve as the valves are operated.

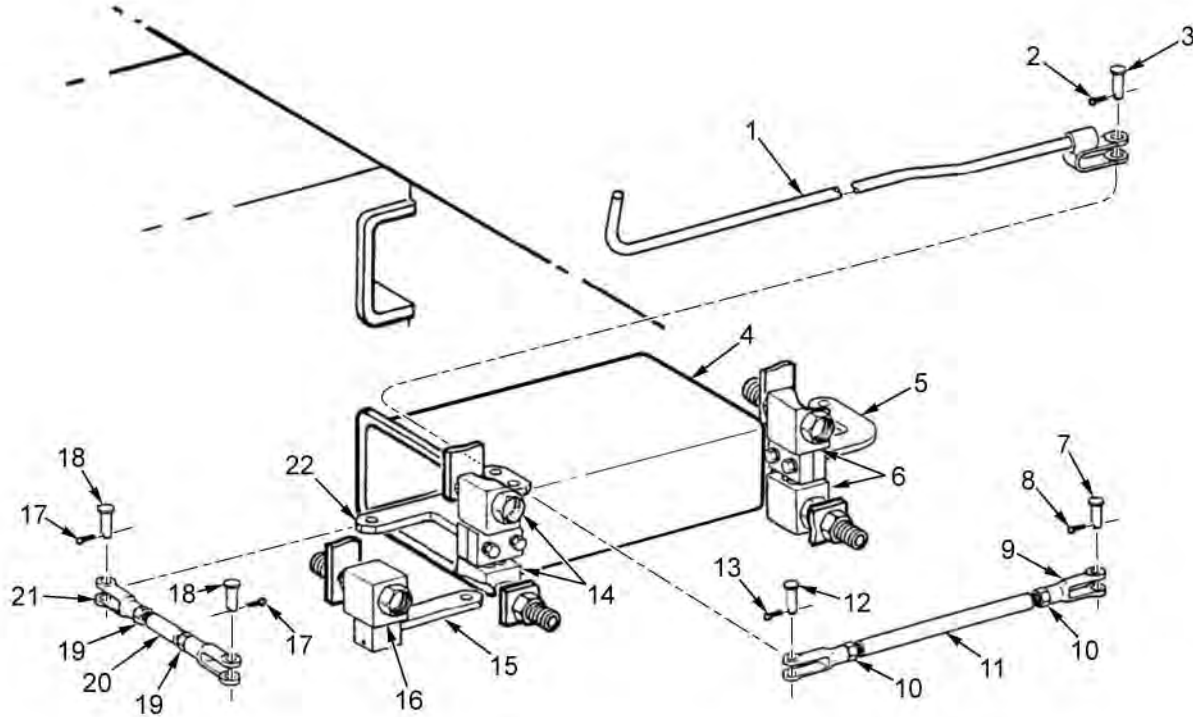
10. Operate manual control lever (Figure 8, Item 1) and check that ball in each ball valve (Figure 8, Item 4) is moving the same amount and in the same direction.
 - a. If each ball in ball valves (Figure 8, Item 4) works properly, tighten down nut on each bulkhead fitting (Figure 8, Item 2) for both ball valves (Figure 8, Item 16).
 - b. If each ball in ball valves (Figure 8, Item 4) does not work properly, refer to repair steps and remove valve. Then, align and install ball valves until valves work properly.



HETT0896

Figure 8. Gooseneck Isolation Valve Assembly Installation.

11. Align and install steering tie rod assembly (Figure 9, Item 21) between manual control lever (Figure 9, Item 15) and manual control lever (Figure 9, Item 22). Secure in place by installing two straight shouldered pins (Figure 9, Item 18) and cotter pins (Figure 9, Item 17).
12. Operate steering tie rod assembly (Figure 9, Item 21) and check for operation and binding.
 - a. Check that each of manual control levers (Figure 9, Item 22 and Item 15) moves ball in each ball valve (Figure 9, Item 14 and Item 16) from full open to full close positions.
 - b. If adjustment is required, loosen jam nut (Figure 9, Item 19) on each end of steering tie rod assembly (Figure 9, Item 21) and rotate steering tie rod (Figure 9, Item 20) either clockwise to shorten or counterclockwise to lengthen, as necessary.
 - c. If adjustment was made, tighten jam nut (Figure 9, Item 19) on both ends of steering tie rod assembly (Figure 9, Item 21). Repeat step 12 and check for full range of operation and/or binding.
 - d. If no adjustments were made, proceed to step 13.
13. Align and install rigid connecting link assembly (Figure 9, Item 9) between manual control lever (Figure 9, Item 5) and manual control lever (Figure 9, Item 22). Secure in place by installing two straight shouldered pins (Figure 9, Item 7 and Item 12) and cotter pins (Figure 9, Item 8 and Item 13).
14. Operate rigid connecting link assembly (Figure 9, Item 9) and check for full range of operation and binding.
 - a. Check that each of manual control levers (Figure 9, Item 5 and Item 22) moves ball in each ball valve (Figure 9, Item 6) from full open to full close positions.
 - b. If adjustment is required, loosen jam nut (Figure 9, Item 10) on each end of rigid connecting link assembly (Figure 9, Item 9) and rotate steering tie rod (Figure 9, Item 11) either clockwise to shorten or counterclockwise to lengthen, as necessary.
 - c. If adjustment was made, tighten jam nut (Figure 9, Item 10) on both ends of steering tie rod assembly (Figure 9, Item 9). Repeat step 14 and check for full range of operation and/or binding.
 - d. If no adjustments were made, proceed to step 15.
15. Pass manual control lever (Figure 9, Item 1) through hydraulic control module (Figure 9, Item 4) and secure manual control lever to manual control lever (Figure 9, Item 22) using straight shouldered pin (Figure 9, Item 3) and cotter pin (Figure 9, Item 2).



HETT0506

Figure 9. Gooseneck Isolation Valve Assembly Installation.

16. Align clamp (Figure 10, Item 2) over manual control lever (Figure 10, Item 3) and secure by installing two bolts (Figure 10, Item 1).
17. Operate manual control lever (Figure 10, Item 3) and check for full range of operation and binding. If any binding occurs or full range of operation is not accomplished, repeat steps 12 and 14 as required.

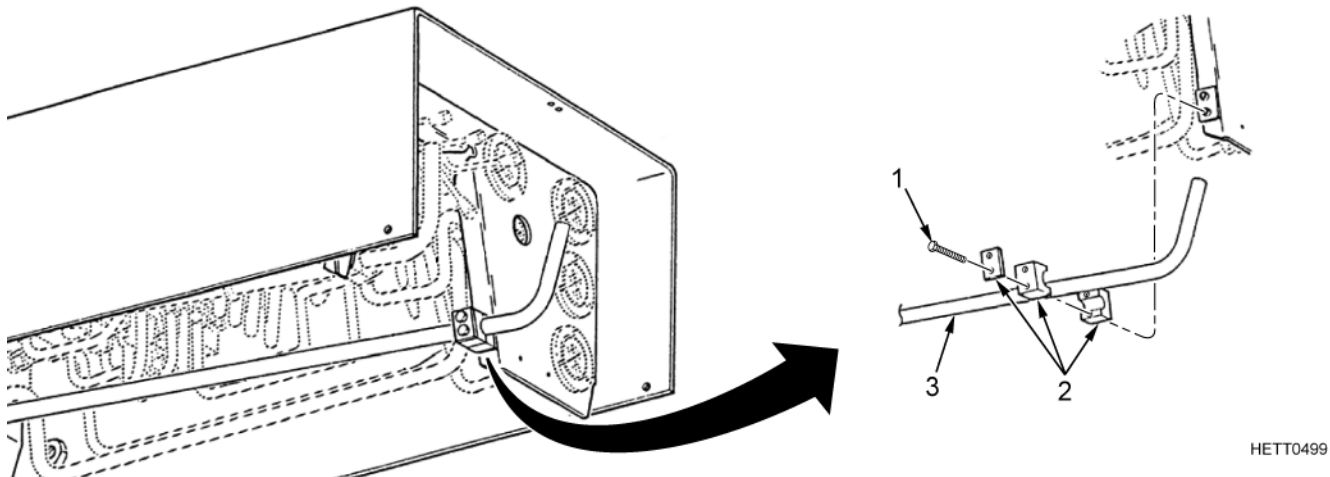


Figure 10. Gooseneck Isolation Valve Assembly Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Ensure hydraulic lines, fittings, and clamps are reconnected to gooseneck isolation valve assembly as required (WP 0124).

Refill hydraulic tank (WP 0039).

Operate gooseneck isolation valve and check for binding (WP 0004).

Perform gooseneck adjustments and check for proper operation (WP 0007).

Couple tractor/semitrailer (WP 0013) and perform highway driving. Check that suspension cylinders and gooseneck cylinders operate properly.

END OF WORK PACKAGE

FIELD MAINTENANCE
GOOSENECK HYDRAULICS

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 1068, Item 28)

Personnel Required

1

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Petroleum Jelly (WP 0170, Item 21)
Pipe Sealant (WP 0170, Item 22)
Rag, Wiping (WP 0170, Item 23)
Solvent, Dry Cleaning (WP 0170, Item 32)
Preformed Packing (4)

Equipment Conditions

Platform step removed (WP 0090)
Gooseneck lowered to lowest position if uncoupled
(WP 0007)
Front and rear support legs lowered supporting platform
(WP 0011 and WP 0012)
Hydraulic tank drained (WP 0040)

GENERAL

This work package contains instructions for the removal and installation of the gooseneck hydraulic system.

REMOVAL**WARNING**

- Hydraulic fluid may be absorbed through the skin. Avoid prolonged exposure to skin and wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into the eyes, flush them immediately with water and seek medical attention. If hydraulic fluid gets on skin, wash thoroughly with soap and water. Wash hands thoroughly prior to eating or smoking. Failure to follow this warning may result in injury to personnel.
- Hydraulic fluid may be hot if system has been in operation. Allow time for system to cool before performing maintenance or injury to personnel may result.
- Residual pressure may remain in hydraulic lines. Open fittings slowly or injury to personnel may result.

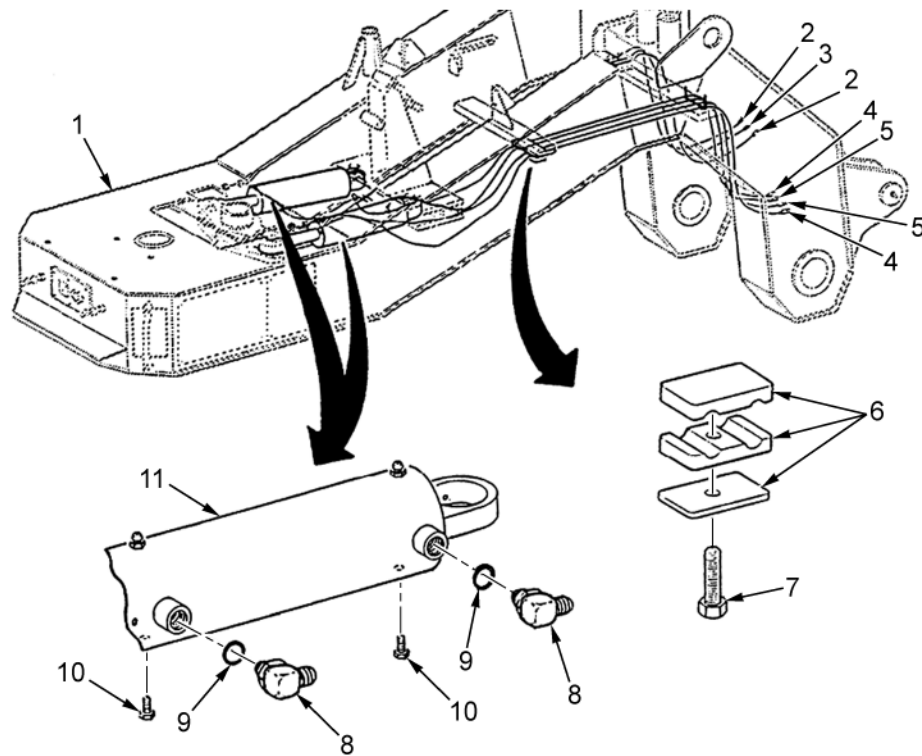
CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or foreign material from entering the hydraulic system or damage to equipment may result.

NOTE

This procedure is for removal/installation of all gooseneck hydraulic components. Perform this procedure, or any portion of this procedure, as required, to complete necessary repairs. Use hydraulic schematic rear foldout Figure FO-3 as a general guide for hose routing.

1. Place a drain pan under gooseneck (Figure 1, Item 1) and tag and remove two hoses (Figure 1, Item 2) and hose (Figure 1, Item 3). Allow fluid to drain; then install caps/plugs into all openings.
2. Tag and disconnect two hoses (Figure 1, Item 4) and two hoses (Figure 1, Item 5). Allow fluid to drain into drain pan; then install caps/plugs into all openings.
3. Remove two bolts (Figure 1, Item 7) and block clamps (Figure 1, Item 6).
4. Remove two hoses (Figure 1, Item 4) and two hoses (Figure 1, Item 5).
5. Place drain pan under gooseneck (Figure 1, Item 1) near steering cylinder (Figure 1, Item 11). Remove two elbows (Figure 1, Item 8), preformed packings (Figure 1, Item 9), and pipe plugs (Figure 1, Item 10) from steering cylinder. Repeat this step for other steering cylinder. Install caps/plugs into all openings. Discard preformed packings.



HETT0509

Figure 1. Gooseneck Hydraulics Removal.

WARNING**SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
- The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound.
- Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.
- Compressed air used for cleaning/drying may create airborne particles that may injure the eyes. Always wear eye protection. Pressure must not exceed 30 psi (207 kPa) or injury to personnel may result.

Failure to follow these warnings may result in injury or death to personnel.

6. Clean inside of hoses with compressed air. Clean outside of hoses with wiping rags. Clean all other components with dry cleaning solvent.
7. Inspect hoses for kinks, splits, deterioration, chafing, cuts, and loose fittings. If hose is defective, replace hose.
8. Inspect other components for nicks, burrs, corrosion, stripped threads, and pitting. If parts are defective, replace as required.

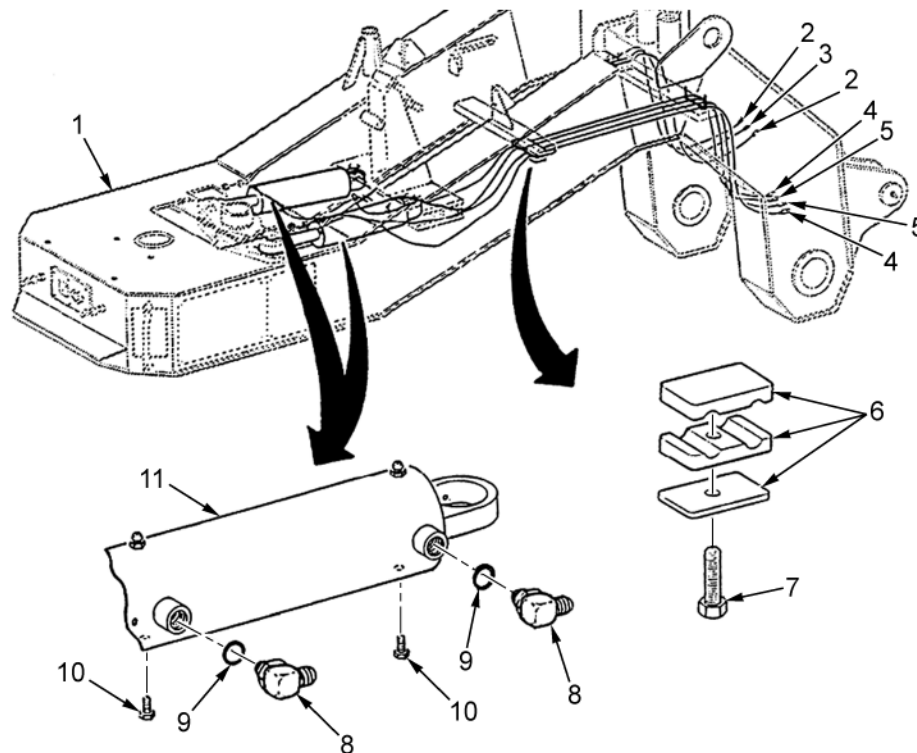
END OF TASK

INSTALLATION

CAUTION

- Apply pipe sealant compound to all male pipe threaded hydraulic fittings, using only enough compound to coat the threads. Do not allow compound to enter a component/fitting or the compound may restrict fluid passages and damage to equipment or premature equipment failure may result.
- Note positioning/orientation of fittings on the illustrations. It is important to have the tightened fittings positioned as shown so that hoses are not too short and fittings do not interfere with one another or damage to equipment may result.

1. Remove caps/plugs, apply pipe sealant to male threads of two pipe plugs (Figure 2, Item 10), and install plugs into each gooseneck (Figure 2, Item 1) steering cylinder (Figure 2, Item 11).
2. Remove caps/plugs. Apply petroleum jelly to two preformed packings (Figure 2, Item 9) and pipe sealant to male threads of two elbows (Figure 2, Item 8) and install preformed packings and elbows into each gooseneck steering cylinder (Figure 2, Item 11).
3. Remove caps/plugs and install two hoses (Figure 2, Item 5), two hoses (Figure 2, Item 4), hose (Figure 2, Item 3), and two hoses (Figure 2, Item 2) into gooseneck steering cylinder (Figure 2, Item 11).
4. Install two block clamps (Figure 2, Item 6) and bolts (Figure 2, Item 7) on gooseneck.



HETT0509

Figure 2. Gooseneck Hydraulics Removal.

END OF TASK

FOLLOW-ON MAINTENANCE

Refill hydraulic tank as required (WP 0039).

Perform hydraulic system bleeding as required (WP 0041).

Install platform step (WP 0090).

END OF WORK PACKAGE

FIELD MAINTENANCE**AUXILIARY POWER UNIT (APU) HYDRAULICS**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Preformed Packing (1)

Preformed Packing (1)

Personnel Required

1

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Petroleum Jelly (WP 0170, Item 21)
Pipe Sealant (WP 0170, Item 22)
Rag, Wiping (WP 0170, Item 23)
Solvent, Dry Cleaning (WP 0170, Item 32)

Equipment Conditions

Hydraulic tank drained (WP 0040)
Gooseneck steps removed from over top of battery and
Auxiliary Power Unit (APU) (WP 0087)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the Auxiliary Power Unit (APU) hydraulics system.

REMOVAL**WARNING**

- Hydraulic fluid may be absorbed through the skin. Avoid prolonged exposure to skin and wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into the eyes, flush them immediately with water and seek medical attention. If hydraulic fluid gets on skin, wash thoroughly with soap and water. Wash hands thoroughly prior to eating or smoking.
- Hydraulic fluid may be hot if system has been in operation. Allow time for system to cool before performing maintenance.
- Residual pressure may remain in hydraulic lines; open fittings slowly.

Failure to follow these warnings may result in serious injury or death to personnel.

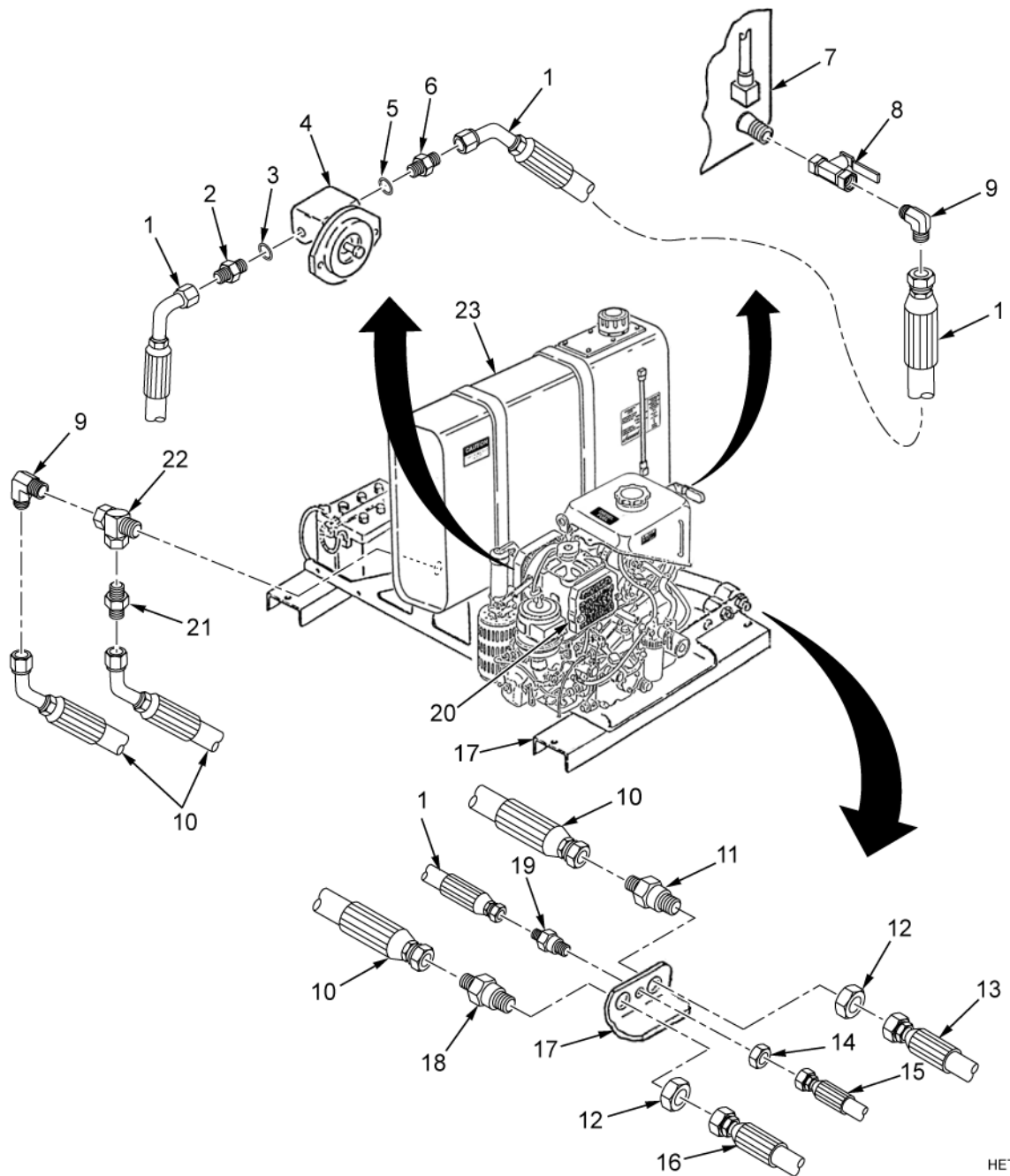
CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or foreign material from entering the hydraulic system or damage to equipment may result.

NOTE

This procedure is for removal/installation of all APU hydraulics components. Perform this procedure, or any portion of this procedure, as required to complete necessary repairs. Use hydraulic schematic rear foldout Figure FO-3 as a general guide for hose routing.

1. Place drain pan under gooseneck and tag and disconnect three hydraulic hoses (Figure 1, Item 16, Item 15, and Item 13) from two tube nipples (Figure 1, Item 11 and Item 18) and tube nipple (Figure 1, Item 19) on APU frame (Figure 1, Item 17). Install caps/plugs into hose openings.
2. Tag and remove two hydraulic hoses (Figure 1, Item 10) from two tube nipples (Figure 1, Item 11 and Item 18) and straight pipe-to-tube adapter (Figure 1, Item 21) and tube elbow (Figure 1, Item 9) on hydraulic tank (Figure 1, Item 23). Install caps/plugs into hose openings.
3. Tag and disconnect hydraulic hose (Figure 1, Item 1) from tube nipple (Figure 1, Item 19) and straight pipe-to-tube adapter (Figure 1, Item 2) on streetside of hydraulic pump (Figure 1, Item 4) on APU (Figure 1, Item 20). Install caps/plugs into hose openings.
4. Remove two fitting nuts (Figure 1, Item 12), two tube nipples (Figure 1, Item 11 and Item 18), fitting nut (Figure 1, Item 14), and tube nipple (Figure 1, Item 19) from APU frame (Figure 1, Item 17). Install caps/plugs onto fittings.
5. Remove straight pipe-to-tube adapter (Figure 1, Item 2) and preformed packing (Figure 1, Item 3) from streetside of hydraulic pump (Figure 1, Item 4). Install caps/plugs into openings and discard preformed packing.
6. Tag and disconnect hydraulic hose (Figure 1, Item 1) from straight pipe-to-tube adapter (Figure 1, Item 6) on curbside of hydraulic pump (Figure 1, Item 4) and tube elbow (Figure 1, Item 9). Install caps/plugs into hose.
7. Remove straight pipe-to-tube adapter (Figure 1, Item 6) and preformed packing (Figure 1, Item 5) from curbside of hydraulic pump (Figure 1, Item 4). Discard preformed packing and install caps/plugs into openings.
8. Remove straight pipe-to-tube adapter (Figure 1, Item 21) and tube elbow (Figure 1, Item 9) from tube tee (Figure 1, Item 22) from hydraulic tank (Figure 1, Item 23). Install caps/plugs into openings.
9. If necessary, refer to WP 0123 and loosen or remove hydraulic tank (Figure 1, Item 7) and remove tube elbow (Figure 1, Item 9) and ball valve (Figure 1, Item 8) from hydraulic tank. Install caps/plugs into openings.



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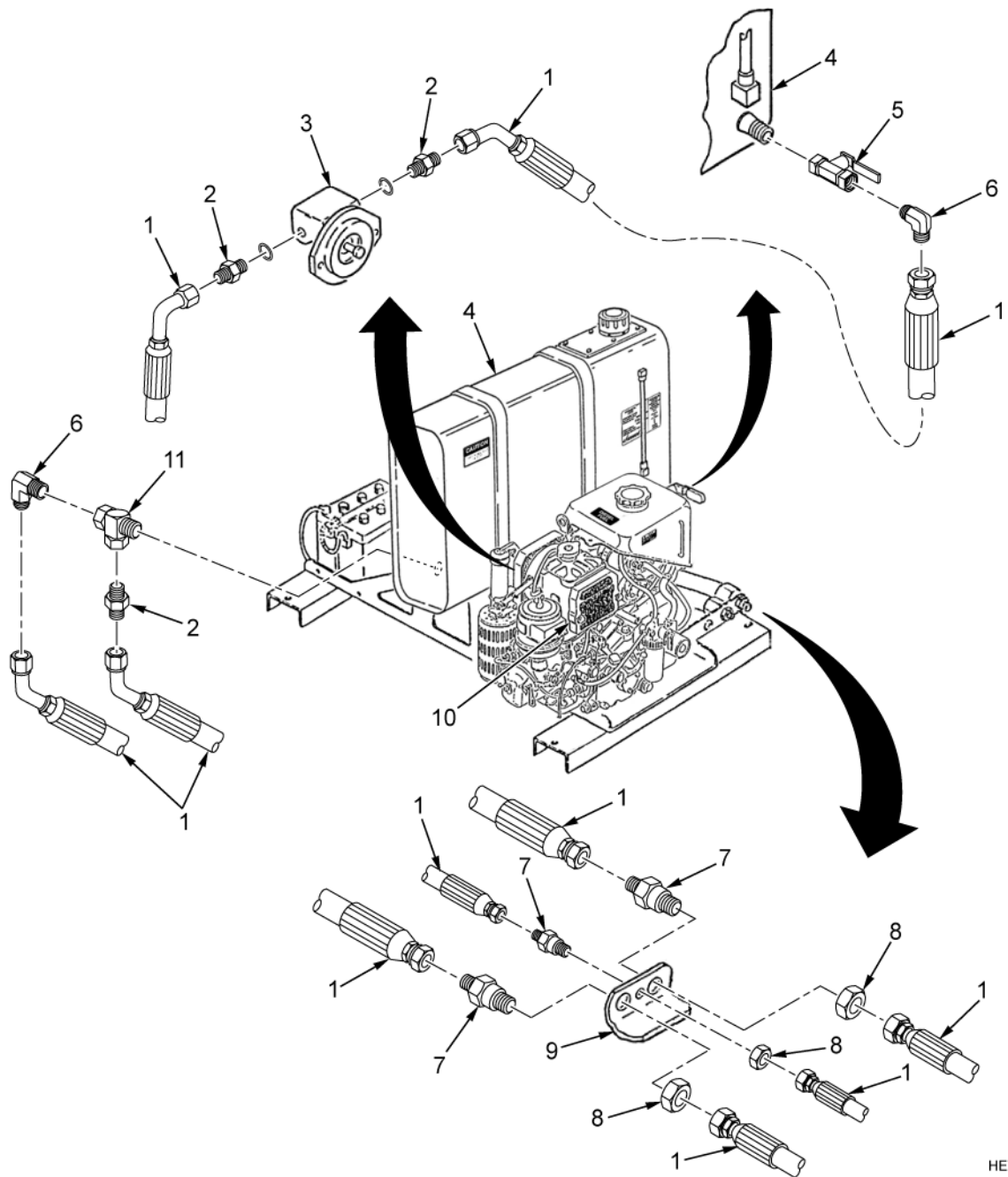
Figure 1. APU Hydraulics Removal.

WARNING**SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
- The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound.
- Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.
- Compressed air used for cleaning/drying may create airborne particles that may injure the eyes. Always wear eye protection. Pressure must not exceed 30 psi (207 kPa).

Failure to follow these warnings may result in injury or death to personnel.

10. Clean inside of hoses (Figure 2, Item 1) with compressed air. Clean outside of hoses with wiping rags.
11. Check and clean threads of pipe-to-tube adapters (Figure 2, Item 2), ball valve (Figure 2, Item 5), tube elbow (Figure 2, Item 6), tube nipples (Figure 2, Item 7), fitting nuts (Figure 2, Item 8), and tube tee (Figure 2, Item 11) with dry cleaning solvent.
12. Inspect hoses (Figure 2, Item 1) for kinks, splits, deterioration, chafing, cuts, and loose fittings. If hose is found defective, replace hose.
13. Inspect pipe-to-tube adapters (Figure 2, Item 2), ball valve (Figure 2, Item 5), tube elbow (Figure 2, Item 6), tube nipples (Figure 2, Item 7), fitting nuts (Figure 2, Item 8), tube tee (Figure 2, Item 11) and APU frame (Figure 2, Item 8) for nicks, burrs, corrosion, stripped threads, and pitting. If parts are defective, replace as required.
14. Inspect hydraulic tank (Figure 2 Item 4) and APU (Figure 2, Item 10) for signs of corrosion and loose fittings or connections. If parts are defective, replace as required.
15. Inspect hydraulic pump (Figure 2, Item 3) body and seal area for nicks, burrs, stripped threads, pitting, and corrosion. If defective, replace as required.



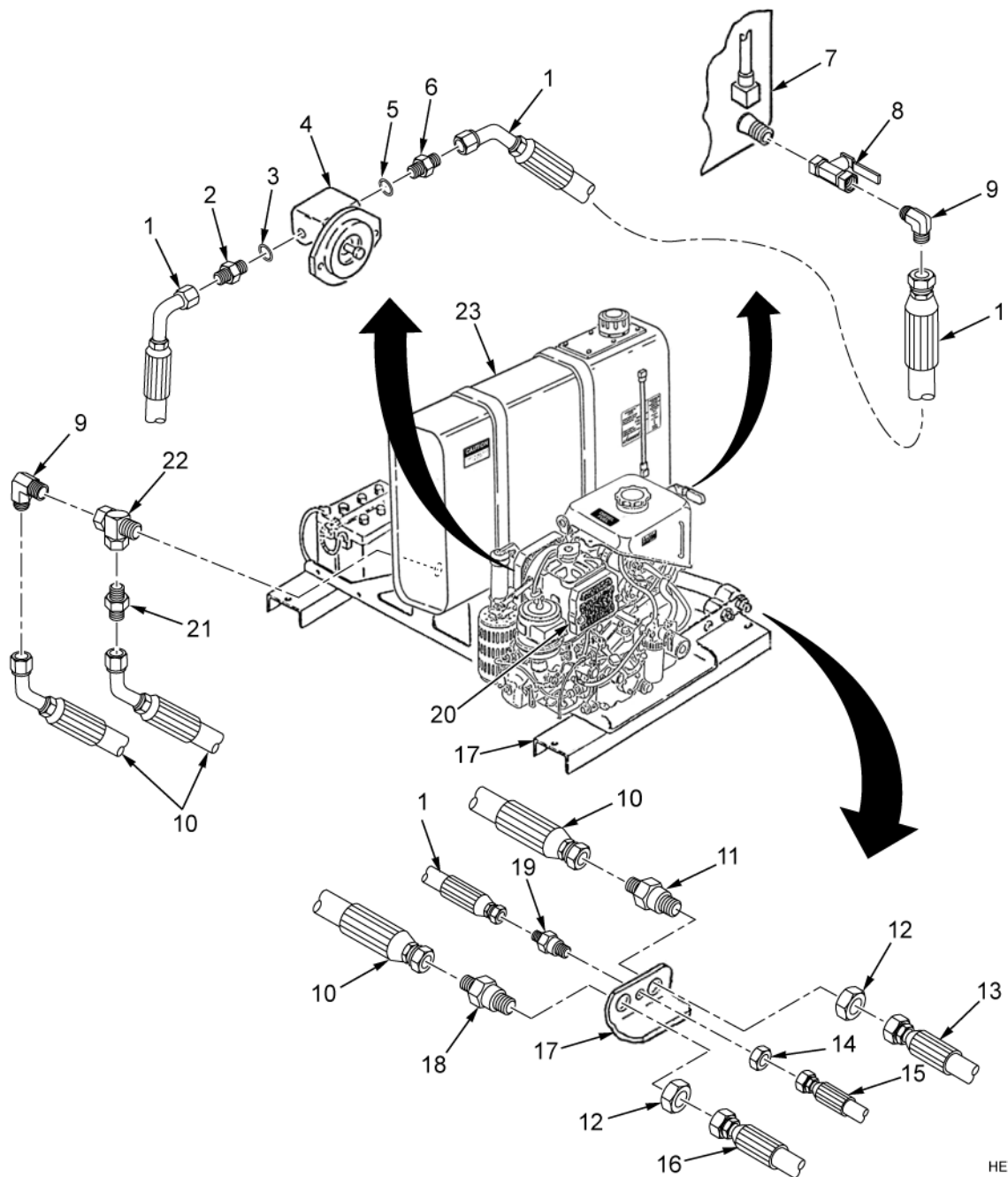
HETT0943

Figure 2. Cleaning.

END OF TASK

INSTALLATION**CAUTION**

- **Apply pipe sealant compound to all male pipe threaded hydraulic fittings, using only enough compound to coat the threads. Do not allow compound to enter a component/fitting or the compound may restrict fluid passages and damage to equipment or premature equipment failure may result.**
 - **Note positioning/orientation of fittings on the illustrations. It is important to have the tightened fittings positioned as shown so that hoses are not too short and fittings do not interfere with one another or damage to equipment may result.**
1. Remove caps/plugs installed and apply pipe sealant to male threads of fittings. Install ball valve (Figure 3, Item 8) and tube elbow (Figure 3, Item 9) onto hydraulic tank (Figure 3, Item 7). If necessary, reinstall hydraulic tank (WP 0123).
 2. Remove caps/plugs and apply pipe sealant to male pipe threads of tube tee (Figure 3, Item 22). Install tube tee onto hydraulic tank (Figure 3, Item 23). Install tube elbow (Figure 3, Item 9) and straight pipe-to-tube adapter (Figure 3, Item 21) onto tube tee.
 3. Lubricate preformed packing (Figure 3, Item 5 and Item 3) with petroleum jelly. Install preformed packing (Figure 3, Item 5) onto straight pipe-to-tube adapter (Figure 3, Item 6). Install preformed packing (Figure 3, Item 3) onto straight pipe-to-tube adapter (Figure 3, Item 2).
 4. Remove caps/plugs and install straight pipe-to-tube adapter (Figure 3, Item 6) into curbside of hydraulic pump (Figure 3, Item 4).
 5. Remove caps/plugs and install straight pipe-to-tube adapter (Figure 3, Item 2) into streetside of hydraulic pump (Figure 3, Item 4).
 6. Remove caps/plugs and install hydraulic hose (Figure 3, Item 1) between tube elbow (Figure 3, Item 9) and straight pipe-to-tube adapter (Figure 3, Item 6).
 7. Remove caps/plugs and install tube nipple (Figure 3, Item 19) onto APU frame (Figure 3, Item 17) and secure with fitting nut (Figure 3, Item 14).
 8. Remove caps/plugs and install two tube nipples (Figure 3, Item 11 and Item 18) onto APU frame (Figure 3, Item 17) and secure with two fitting nuts (Figure 3, Item 12).
 9. Remove caps/plugs and install hydraulic hose (Figure 3, Item 1) on straight pipe-to-tube adapter (Figure 3, Item 2) on streetside of hydraulic pump (Figure 3, Item 4) and tube nipple (Figure 3, Item 19) on APU (Figure 3, Item 20).
 10. Remove caps/plugs and install two hydraulic hoses (Figure 3, Item 10) from tube tee (Figure 3, Item 22) and straight pipe-to-tube adapter (Figure 3, Item 21) on hydraulic tank (Figure 3, Item 23) to two tube nipples (Figure 3, Item 11 and Item 18) on APU frame (Figure 3, Item 17).
 11. Remove caps/plugs and install three hydraulic hoses (Figure 3, Item 16, Item 15, and Item 13) onto two tube nipples (Figure 3, Item 11 and Item 18) and tube nipple (Figure 3, Item 19).



HETT0510

Figure 3. APU Hydraulics Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Refill hydraulic tank as required (WP 0039).

Perform hydraulic system bleeding as required (WP 0041).

END OF WORK PACKAGE

FIELD MAINTENANCE**STEP HYDRAULICS**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Personnel Required

1

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Rag, Wiping (WP 0170, Item 23)
Solvent, Dry Cleaning (WP 0170, Item 32)

Equipment Conditions

Hydraulic tank drained (WP 0040)
Front and rear support legs lowered supporting platform
(WP 0011 and WP 0012)
Platform step removed (WP 0090)

GENERAL INFORMATION

This work package provides instructions for the removal and installation of the step hydraulics.

REMOVAL**WARNING**

- Hydraulic fluid may be absorbed through the skin. Avoid prolonged exposure to skin and wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into the eyes, flush them immediately with water and seek medical attention. If hydraulic fluid gets on skin, wash thoroughly with soap and water. Wash hands thoroughly prior to eating or smoking.
- Hydraulic fluid may be hot if system has been in operation. Allow time for system to cool before performing maintenance.
- Residual pressure may remain in hydraulic lines; open fittings slowly.

Failure to follow these warnings may result in serious injury or death to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or foreign material from entering the hydraulic system or damage to equipment may result.

NOTE

This procedure is for removal/installation of step hydraulic components. Perform this procedure, or any portion of this procedure, as required, to complete necessary repairs. Use hydraulic schematic rear foldout Figure FO-3 as a general guide for hose routing.

1. Use drain pan placed under gooseneck steps for drainage. Tag and disconnect seven hoses (Figure 1, Item 11) from fittings on step weldment (Figure 1, Item 20). Install caps/plugs into hoses disconnected.
2. Tag and remove two hydraulic tubes (Figure 1, Item 18) from elbow fittings (Figure 1, Item 19) and tee fittings (Figure 1, Item 17). Remove two fitting nuts (Figure 1, Item 13) and elbow fittings (Figure 1, Item 19) from step weldment (Figure 1, Item 20). Install caps/plugs into openings.
3. Tag and remove two hydraulic tubes (Figure 1, Item 15) from elbow fittings (Figure 1, Item 14) and tee fittings (Figure 1, Item 16). Remove two fitting nuts (Figure 1, Item 12) and elbow fittings (Figure 1, Item 14) from step weldment (Figure 1, Item 20). Install caps/plugs into openings.
4. Tag and remove hydraulic hose (Figure 1, Item 1) from tube nipple (Figure 1, Item 2) and reducer adapter (Figure 1, Item 21) on hydraulic control module (Figure 1, Item 22). Remove fitting nut (Figure 1, Item 26) and tube nipple (Figure 1, Item 2) from step weldment (Figure 1, Item 20). Install caps/plugs into openings.
5. Tag and remove hydraulic hose (Figure 1, Item 4) from elbow fitting (Figure 1, Item 3) and bulkhead fitting (Figure 1, Item 23) on gooseneck isolation valve (Figure 1, Item 24). Remove fitting nut (Figure 1, Item 25) and elbow fitting (Figure 1, Item 3) from step weldment (Figure 1, Item 20). Install caps/plugs into openings.
6. Tag and remove hydraulic hose (Figure 1, Item 6) from elbow fitting (Figure 1, Item 5) on step weldment (Figure 1, Item 20) and elbow fitting (Figure 1, Item 8) on hydraulic control module (Figure 1, Item 22). Remove fitting nut (Figure 1, Item 10) and elbow fitting (Figure 1, Item 5) from step weldment (Figure 1, Item 20). Install caps/plugs into openings.
7. Tag and disconnect hydraulic tube (Figure 1, Item 9) from elbow fitting (Figure 1, Item 8). Install caps/plugs into tube. Remove fitting nut (Figure 1, Item 7) and elbow fitting (Figure 1, Item 8) from hydraulic control module (Figure 1, Item 22). Install caps/plugs into openings.

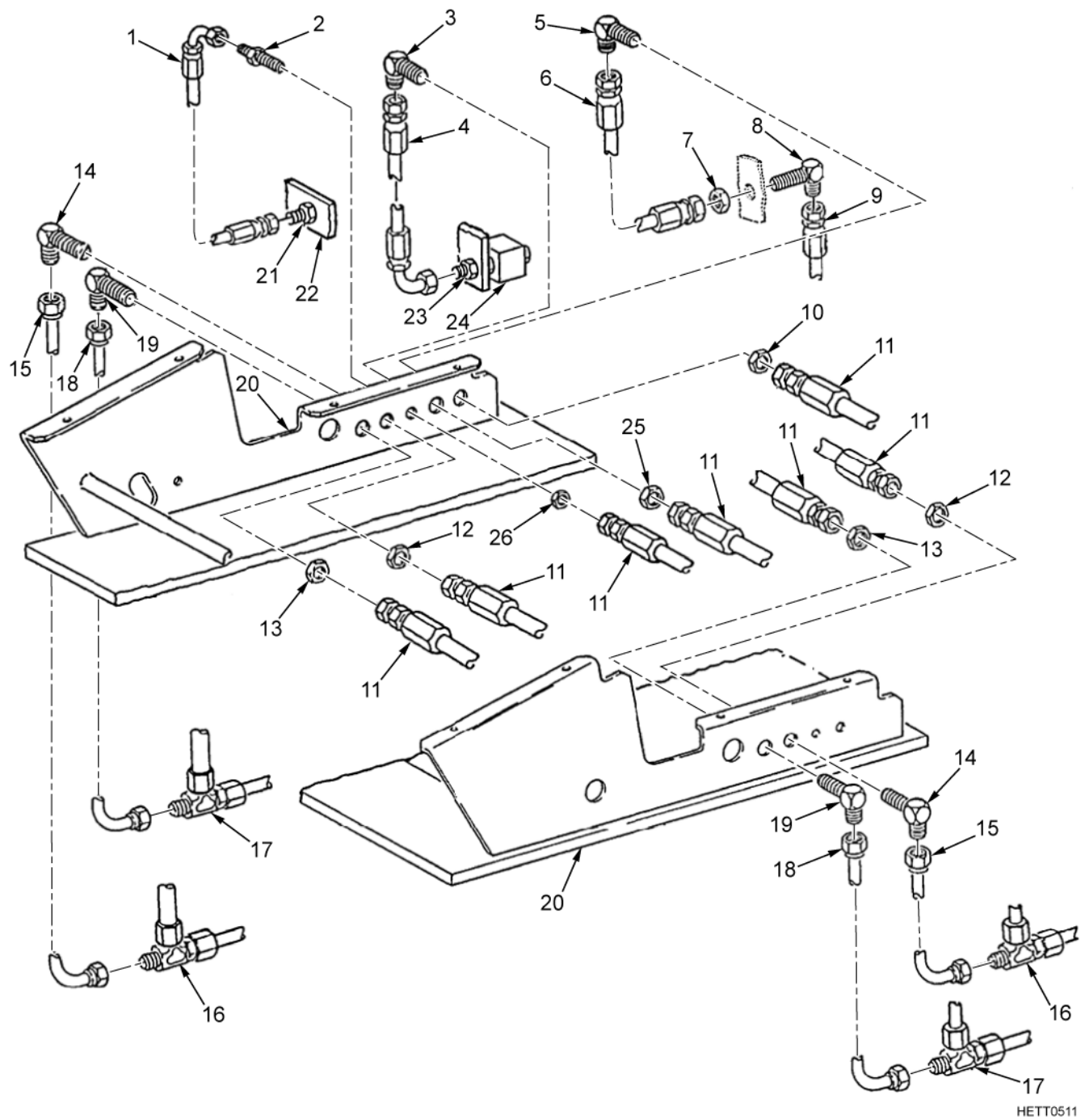


Figure 1. Step Hydraulics Removal.

WARNING**SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
- The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound.
- Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.
- Compressed air used for cleaning/drying may create airborne particles that may injure the eyes. Always wear eye protection. Pressure must not exceed 30 psi (207 kPa).

Failure to follow these warnings may result in serious injury or death to personnel.

8. Clean inside of hoses (Figure 2, Item 1) and hydraulic tubes (Figure 2, Item 5) with compressed air. Clean outside of hoses with wiping rags.
9. Check and clean threads of tube nipples (Figure 2, Item 2), elbow fittings (Figure 2, Item 3), nuts (Figure 2, Item 4), tee fittings (Figure 2, Item 6), reducer adapter (Figure 2, Item 8), bulkhead fitting (Figure 2, Item 10), and gooseneck ISO valve (Figure 2, Item 11) with dry cleaning solvent.
10. Inspect hoses (Figure 2, Item 1) and hydraulic tubes (Figure 2, Item 5) for kinks, splits, deterioration, chafing, cuts, and loose fittings. If hose is defective, replace hose.
11. Inspect tube nipples (Figure 2, Item 2), elbow fittings (Figure 2, Item 3), nuts (Figure 2, Item 4), tee fittings (Figure 2, Item 6), reducer adapter (Figure 2, Item 8), bulkhead fitting (Figure 2, Item 10), and gooseneck ISO valve (Figure 2, Item 11) for nicks, burrs, corrosion, stripped threads, broken castings, and pitting. Replace defective parts as required.
12. Inspect step weldment (Figure 2, Item 7) and hydraulic control module (Figure 2, Item 9) for signs of corrosion, cracks, stripped threads, or any other signs of damage. If parts are defective, replace as required.

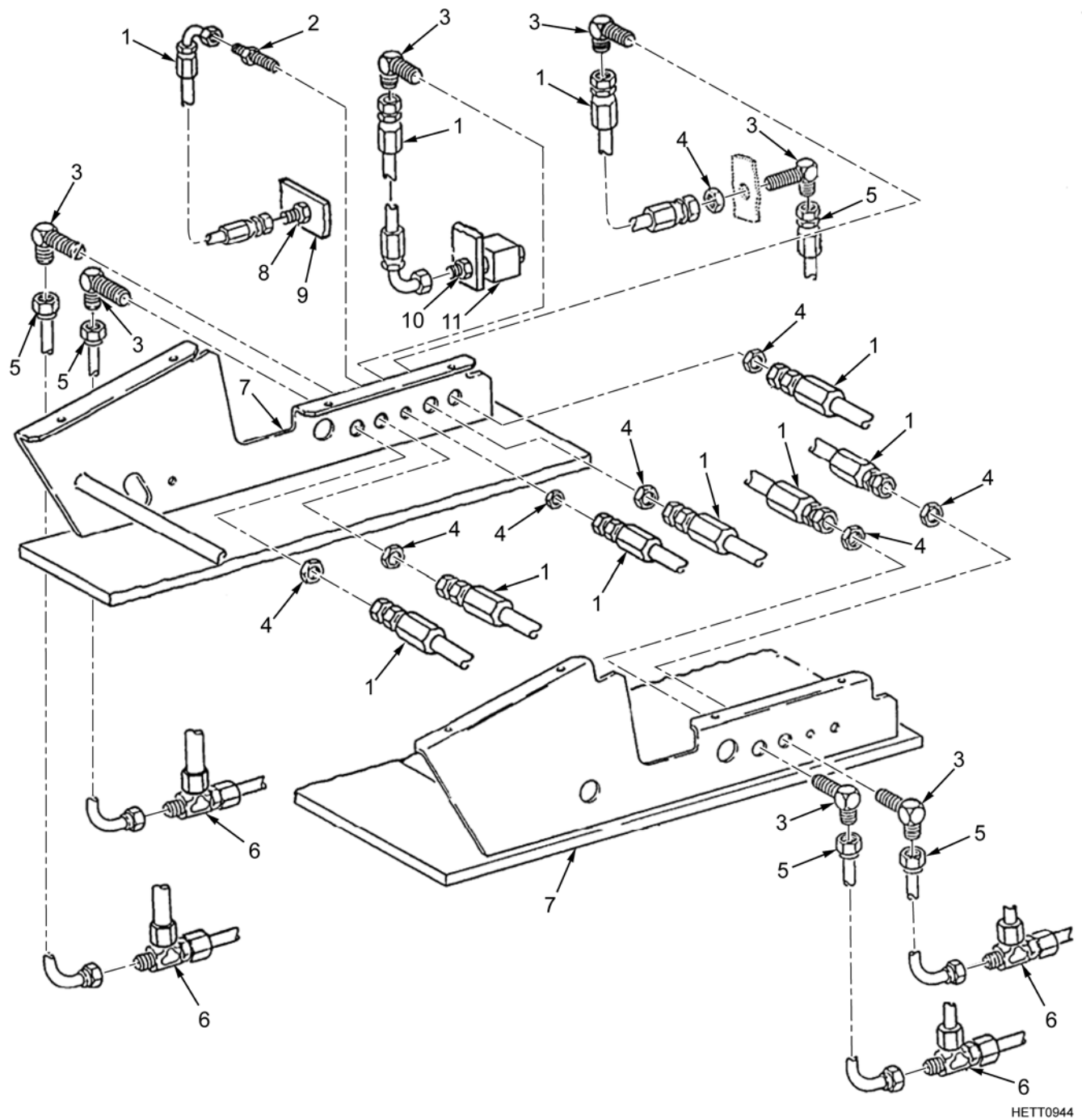


Figure 2. Cleaning.

END OF TASK

INSTALLATION**CAUTION**

Note positioning/orientation of fittings on the illustrations. It is important to have the tightened fittings positioned as shown so that hoses are not too short and fittings do not interfere with one another or damage to equipment may result.

1. Remove caps/plugs and install elbow fitting (Figure 3, Item 8) onto hydraulic control module (Figure 3, Item 22) and secure with fitting nut (Figure 3, Item 7).
2. Remove caps/plugs and install elbow fitting (Figure 3, Item 5) onto step weldment (Figure 3, Item 20) and secure with fitting nut (Figure 3, Item 10).
3. Remove caps/plugs and connect hydraulic tube (Figure 3, Item 9) to elbow fitting (Figure 3, Item 8). Remove caps/plugs and install hydraulic hose (Figure 3, Item 6) between elbow fitting (Figure 3, Item 5) and elbow fitting (Figure 3, Item 8).
4. Remove caps/plugs and install elbow fitting (Figure 3, Item 3) onto step weldment (Figure 3, Item 20) and secure in place with fitting nut (Figure 3, Item 25).
5. Remove caps/plugs and install hydraulic hose (Figure 3, Item 4) between elbow fitting (Figure 3, Item 3) on step weldment (Figure 3, Item 20) and bulkhead fitting (Figure 3, Item 23) on gooseneck isolation valve (Figure 3, Item 24).
6. Remove caps/plugs and install tube nipple (Figure 3, Item 2) onto step weldment (Figure 3, Item 20) and secure in place with fitting nut (Figure 3, Item 26).
7. Remove caps/plugs and install hydraulic hose (Figure 3, Item 1) between tube nipple (Figure 3, Item 2) on step weldment (Figure 3, Item 20) and reducer adapter (Figure 3, Item 21) on hydraulic control module (Figure 3, Item 22).
8. Remove caps/plugs and install two tube elbows (Figure 3, Item 14) onto step weldment (Figure 3, Item 20) and secure in place with fitting nuts (Figure 3, Item 12).
9. Remove caps/plugs and install two hydraulic tubes (Figure 3, Item 15) between tube elbows (Figure 3, Item 14) on step weldment (Figure 3, Item 20) and tee fittings (Figure 3, Item 16).
10. Remove caps/plugs and install two tube elbows (Figure 3, Item 19) onto step weldment (Figure 3, Item 20) and secure in place with fitting nuts (Figure 3, Item 13).
11. Remove caps/plugs and install two hydraulic tubes (Figure 3, Item 18) between tube elbows (Figure 3, Item 19) on step weldment (Figure 3, Item 20) and tee fittings (Figure 3, Item 17).
12. Remove caps/plugs and install seven hydraulic hoses (Figure 3, Item 11) onto fittings on step weldment (Figure 3, Item 20).

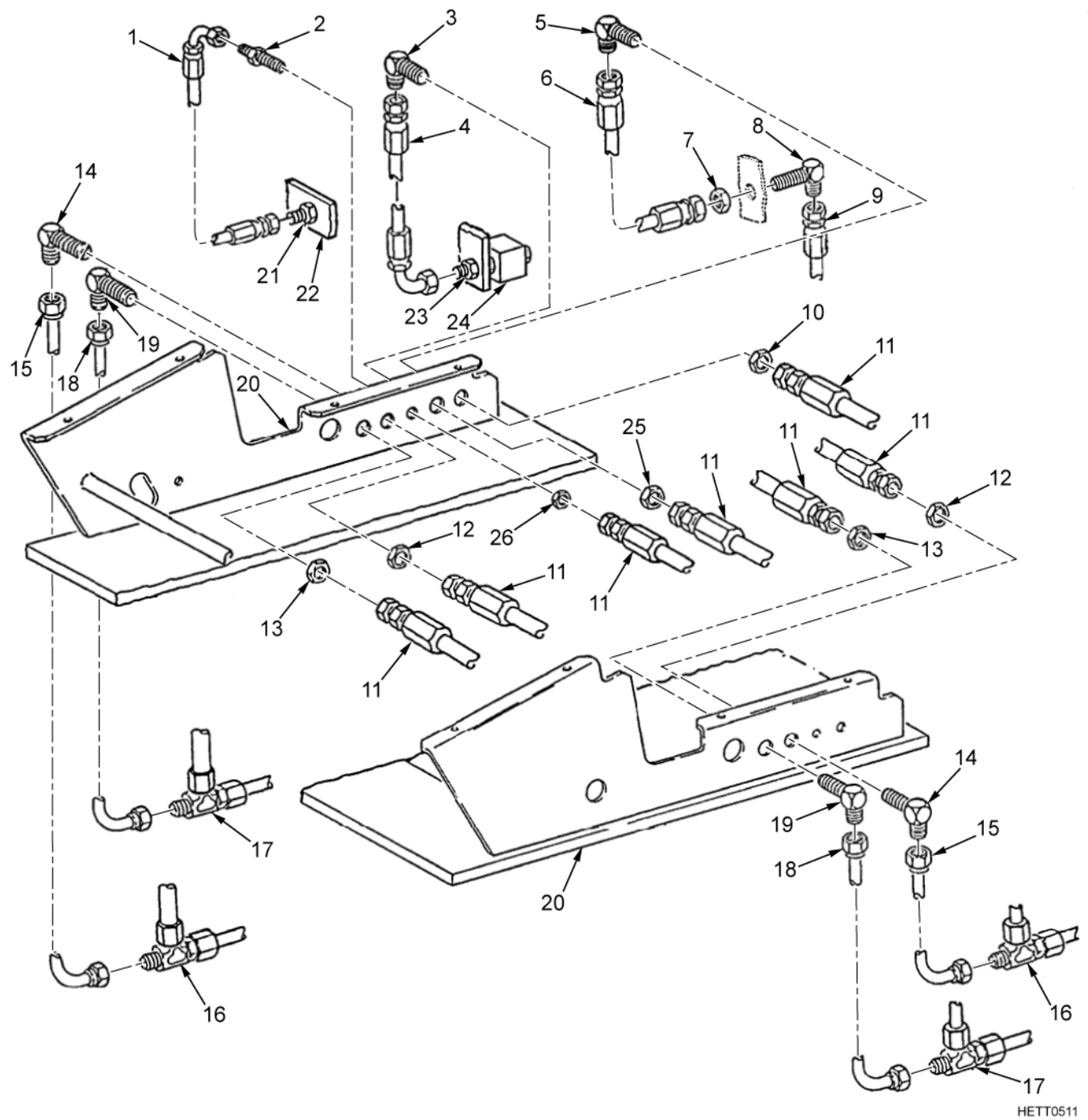


Figure 3. Step Hydraulics Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Refill hydraulic tank as required (WP 0040).

Perform hydraulic system bleeding as required (WP 0041).

END OF WORK PACKAGE

FIELD MAINTENANCE
HYDRAULIC PRESSURE GAUGES

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Pipe Sealant (WP 0170, Item 22)
Rag, Wiping (WP 0170, Item 23)
Solvent, Dry Cleaning (WP 0170, Item 32)
Tape, Teflon (WP 0170, Item 37)
Self-Locking Nut (12)

Equipment Conditions

Platform adjusted to 50 in. (127 cm) height (WP 0008)
Suspension isolation valve handle placed in ADJUST position (WP 0004)
Gooseneck isolation valve handle placed in ADJUST position (WP 0004)
Suspension isolation valves isolated at four corner bogies (WP 0004)
All pressure gauges reading 0 psi (0 kPa) (WP 0004)

Personnel Required

2

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the hydraulic pressure gauges.

REMOVAL**WARNING**

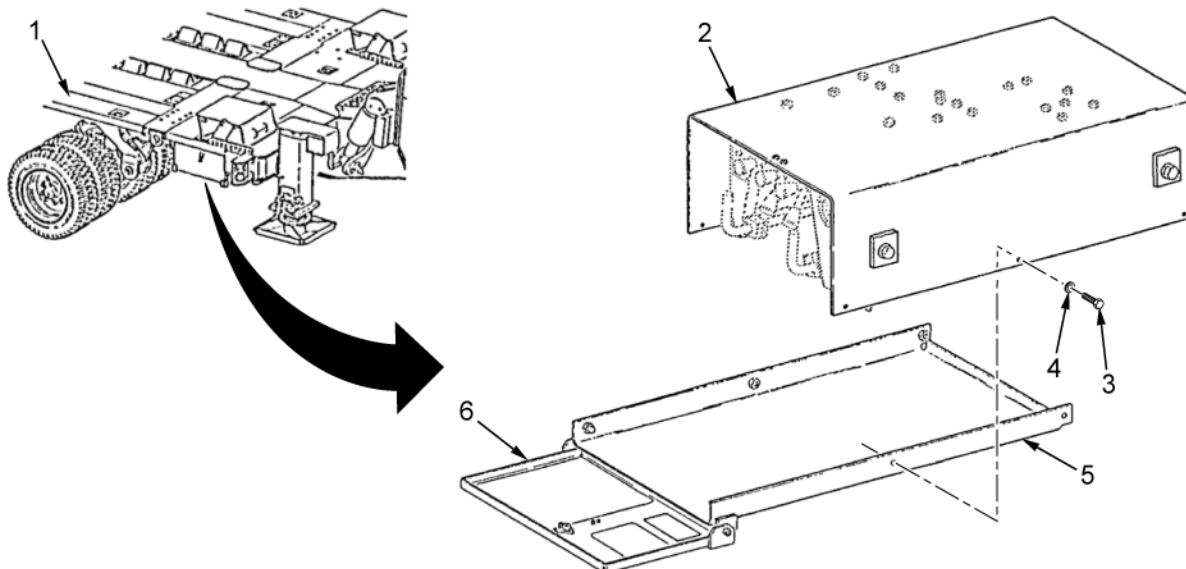
- Hydraulic fluid may be absorbed through the skin. Avoid prolonged exposure to skin and wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into the eyes, flush them immediately with water and seek medical attention. If hydraulic fluid gets on skin, wash thoroughly with soap and water. Wash hands thoroughly prior to eating or smoking.
- Hydraulic fluid may be hot if system has been in operation. Allow time for system to cool before performing maintenance.
- Residual pressure may remain in hydraulic lines; open fittings slowly.

Failure to follow these warnings may result in serious injury or death to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or foreign material from entering the hydraulic system or damage to equipment may result.

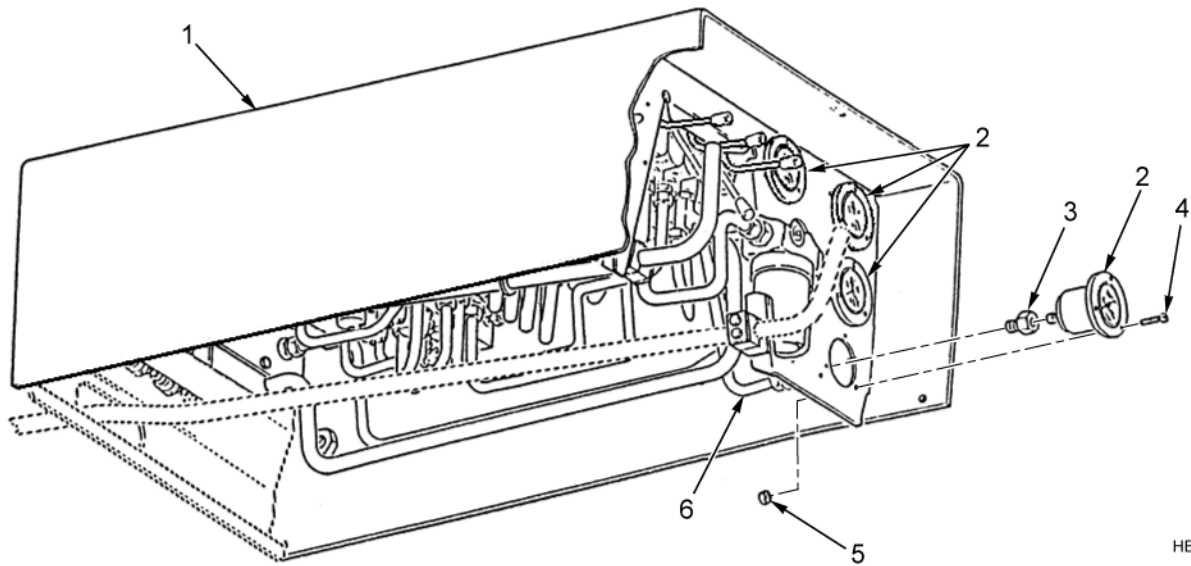
1. Ensure hydraulic control module door panel is lowered (WP 0004).
2. Use two people to remove six capscrews (Figure 1, Item 3), lockwashers (Figure 1, Item 4), and lower panel (Figure 1, Item 5) from hydraulic control module (Figure 1, Item 2). Carefully remove lower panel, with door panel (Figure 1, Item 6) attached, out from under semitrailer and place on platform (Figure 1, Item 1). Discard six lockwashers.



HETT0496

Figure 1. Hydraulic Pressure Gauges Removed.

3. Use drain pan placed under platform for drainage, and tag and disconnect hydraulic tube (Figure 2, Item 6) from straight pipe-to-tube adapter (Figure 2, Item 3) on pressure gauge (Figure 2, Item 2).
4. Remove three self-locking nuts (Figure 2, Item 5), screws (Figure 2, Item 4), and pressure gauge (Figure 2, Item 2). Remove straight pipe-to-tube adapter (Figure 2, Item 3) from pressure gauge. Discard self-locking nuts. Install caps/plugs into openings.
5. Repeat steps 3 and 4 to remove three remaining pressure gauges (Figure 2, Item 2) from hydraulic control module (Figure 2, Item 1), as required.



HETT0513

Figure 2. Hydraulic Pressure Gauges Removal.

WARNING**SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
- The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound.
- Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.

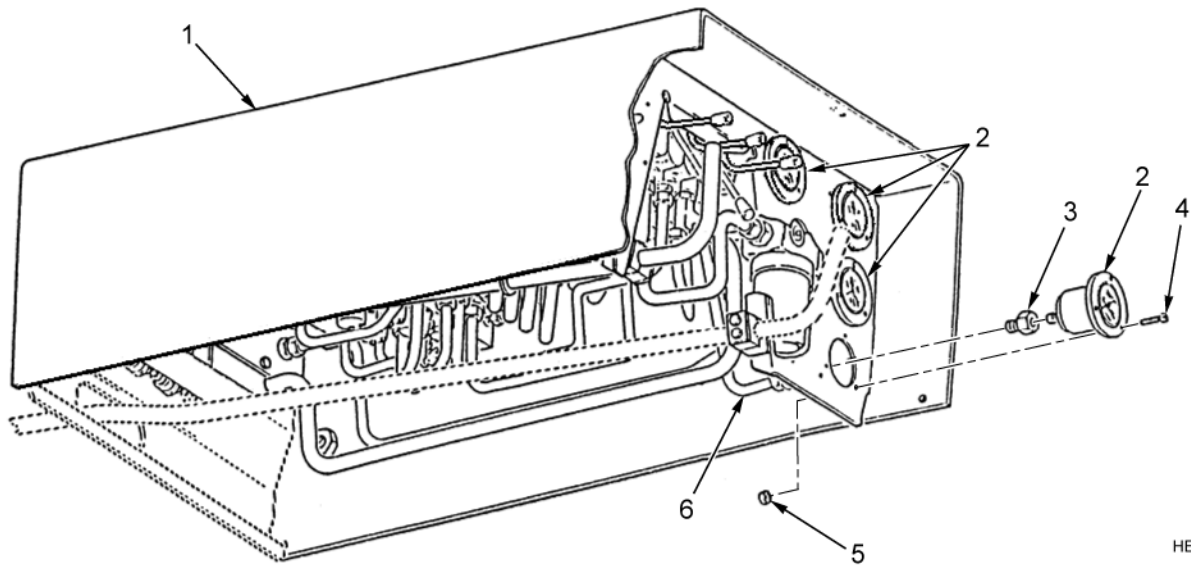
Failure to follow these warnings may result in injury or death to personnel.

6. Clean pressure gauges with wiping rags. Clean all other components with dry cleaning solvent.
7. Inspect pressure gauges for cracked or broken glass, bent needles, stripped threads, or evidence of leakage. Replace any defective gauges.

END OF TASK

INSTALLATION

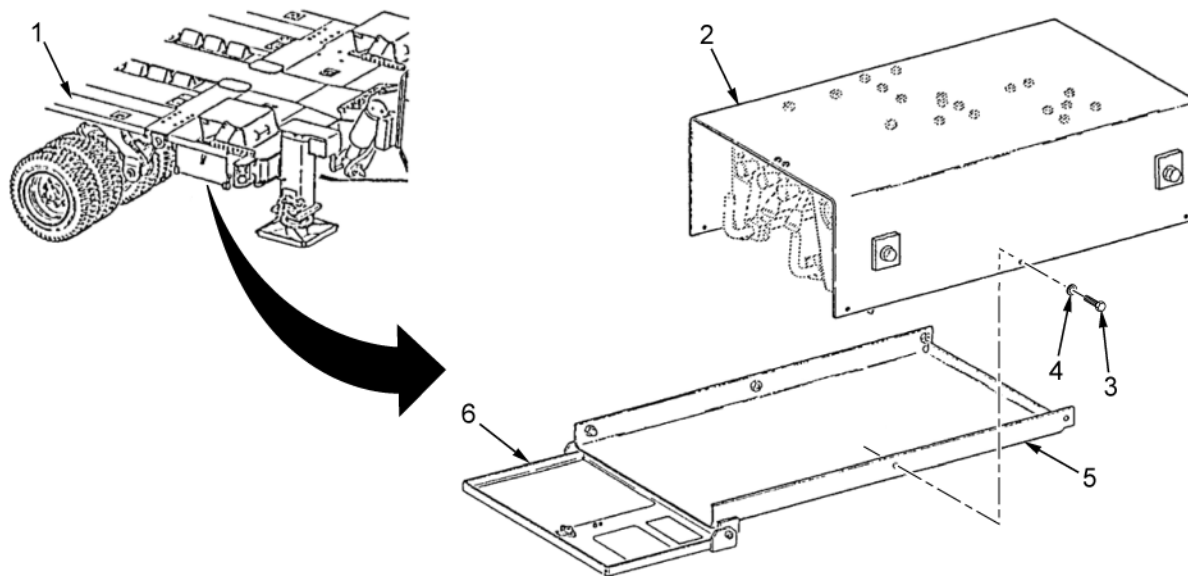
1. Prepare threads of pressure gauge (Figure 3, Item 2) in accordance with step a or step b:
 - a. Apply pipe sealant to threads, except for last two threads at open end.
 - b. Apply two turns of Teflon tape to threads, leaving last two threads at open end uncovered.
2. Install straight pipe-to-tube adapter (Figure 3, Item 3) onto pressure gauge (Figure 3, Item 2). Align and install pressure gauge and secure with three screws (Figure 3, Item 4) and self-locking nuts (Figure 3, Item 5).
3. Remove caps/plugs and connect hydraulic tube (Figure 3, Item 6) onto straight pipe-to-tube adapter (Figure 3, Item 3) on pressure gauge (Figure 3, Item 2).
4. Repeat steps 1, 2, and 3 to install and connect all pressure gauges (Figure 3, Item 2) removed from hydraulic control module (Figure 3, Item 1), as required.



HETT0513

Figure 3. Hydraulic Pressure Gauges Installation.

5. Use two people to align and install lower panel (Figure 4, Item 5), with door panel (Figure 4, Item 6) attached, onto hydraulic control module (Figure 4, Item 2). Secure lower panel in place by installing six lockwashers (Figure 4, Item 4) and capscrews (Figure 4, Item 3) on underside of semitrailer platform (Figure 4, Item 1).



HETT0496

Figure 4. Hydraulic Pressure Gauges Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Perform hydraulic system bleeding as required (WP 0041).

Operate suspension and check pressure gauge reading for proper operation (WP 0004).

END OF WORK PACKAGE

FIELD MAINTENANCE

HYDRAULIC FILTER

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Preformed Packing (2)
Preformed Packing (1)
Filter Element (1)

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Hydraulic Fluid (WP 0170, Item 17)
Petroleum Jelly (WP 0170, Item 21)
Pipe Sealant (WP 0170, Item 22)
Rag, Wiping (WP 0170, Item 23)
Solvent, Dry Cleaning (WP 0170, Item 32)

Personnel Required

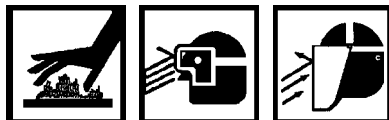
2

Equipment Conditions

Hydraulic oil valve at reservoir closed (handle upright)
(WP 0004)
One suspension valve (hydraulic control console) secured
in full up position (WP 0004)

GENERAL INFORMATION

This work package contains instructions for the element change, removal, and installation of the hydraulic filter.

ELEMENT CHANGE**WARNING**

- Hydraulic fluid may be absorbed through the skin. Avoid prolonged exposure to skin and wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into the eyes, flush them immediately with water and seek medical attention. If hydraulic fluid gets on skin, wash thoroughly with soap and water. Wash hands thoroughly prior to eating or smoking.
- Hydraulic fluid may be hot if system has been in operation. Allow time for system to cool before performing maintenance.
- Residual pressure may remain in hydraulic lines; open fittings slowly.

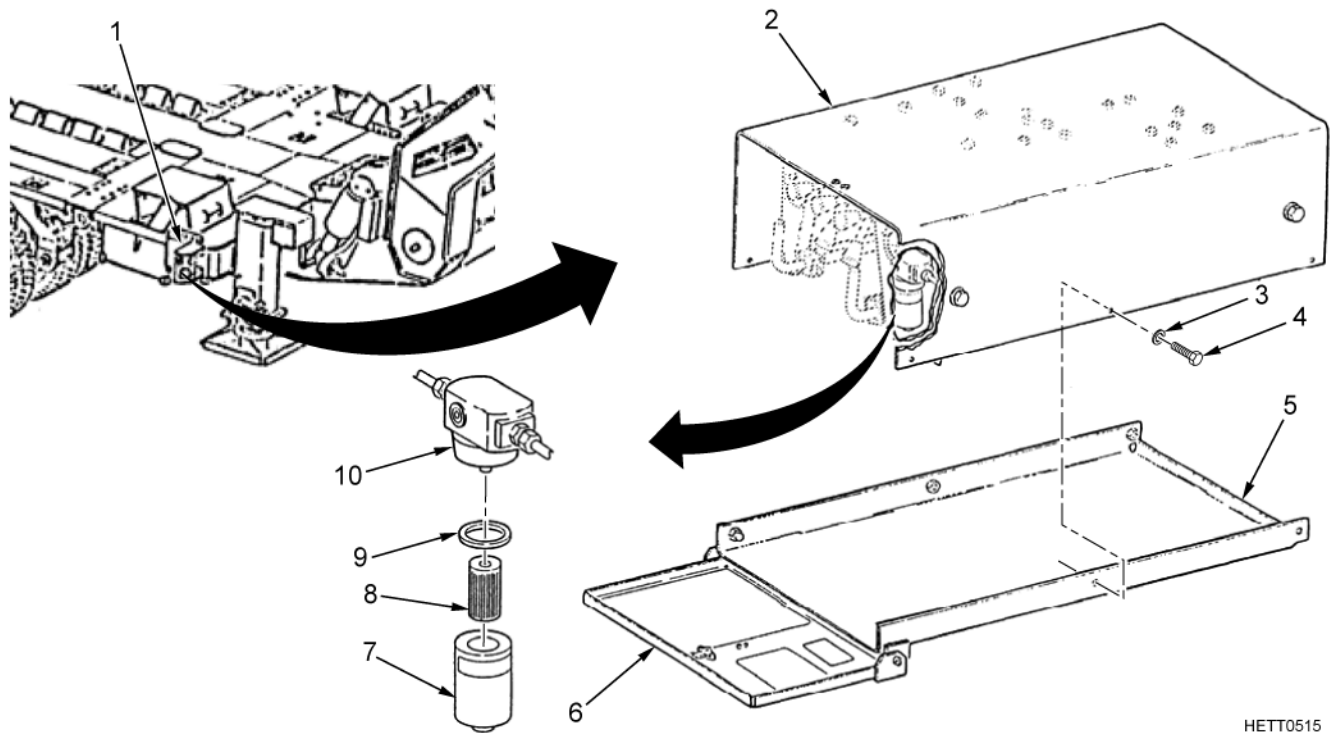
Failure to follow these warnings may result in serious injury or death to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or foreign material from entering the hydraulic system or damage to equipment may result.

1. Ensure hydraulic control module door panel is lowered (WP 0004).
2. Use two personnel to remove six capscrews (Figure 1, Item 4), lockwashers (Figure 1, Item 3), and lower panel (Figure 1, Item 5) from hydraulic control module (Figure 1, Item 2). Carefully remove lower panel, with panel door (Figure 1, Item 6) attached, out from under semitrailer and place on platform (Figure 1, Item 1). Discard six lockwashers.
3. Use drain pan placed under hydraulic control module (Figure 1, Item 2) for drainage and 1 1/4 in. wrench to unscrew and remove filter element housing (Figure 1, Item 7) from filter block (Figure 1, Item 10).
4. Remove filter element (Figure 1, Item 8) and preformed packing (Figure 1, Item 9). Discard filter element and preformed packing. Pour fluid inside of filter element housing (Figure 1, Item 7) into drain pan.
5. Install new filter element (Figure 1, Item 8) into filter element housing (Figure 1, Item 7). Apply a thin coat of petroleum jelly onto preformed packing (Figure 1, Item 9). Install preformed packing onto filter block (Figure 1, Item 10).
6. Install filter element housing (Figure 1, Item 7), with filter element (Figure 1, Item 8) and preformed packing (Figure 1, Item 9) attached, to filter block (Figure 1, Item 10). Use 1 1/4 in. wrench to tighten filter element housing onto filter block.

7. Use two personnel to align and install lower panel (Figure 1, Item 5), with door panel (Figure 1, Item 6) attached, onto hydraulic control module (Figure 1, Item 2). Secure lower panel in place by installing six lockwashers (Figure 1, Item 3) and capscrews (Figure 1, Item 4) on underside of semitrailer platform (Figure 1, Item 1). Close door panel.



HETT0515

Figure 1. Hydraulic Filter Element Change.

END OF TASK

REMOVAL**NOTE**

Perform steps 1 and 2 of element change in this work package.

1. Use drain pan placed under hydraulic control module for drainage. Tag and disconnect two hydraulic tubes (Figure 2, Item 6) from straight pipe-to-tube adapters (Figure 2, Item 5) on hydraulic filter (Figure 2, Item 11).
2. Remove two bolts (Figure 2, Item 2), lockwashers (Figure 2, Item 3), and hydraulic filter (Figure 2, Item 11) from hydraulic control module (Figure 2, Item 1). Discard lockwashers.
3. Remove two straight pipe-to-tube adapters (Figure 2, Item 5) and two preformed packings (Figure 2, Item 4) from hydraulic filter (Figure 2, Item 11). Install caps/plugs into all openings. Discard preformed packings.
4. If hydraulic filter (Figure 2, Item 11) needs to be disassembled, proceed as follows:
 - a. Use drain pan placed under hydraulic control module for drainage and 1 1/4 in. wrench to unscrew and remove filter element housing (Figure 2, Item 10) from filter block (Figure 2, Item 7).
 - b. Remove filter element (Figure 2, Item 9) and preformed packing (Figure 2, Item 8). Discard filter element and preformed packing.
 - c. Pour fluid inside of filter element housing (Figure 2, Item 10) into drain pan.

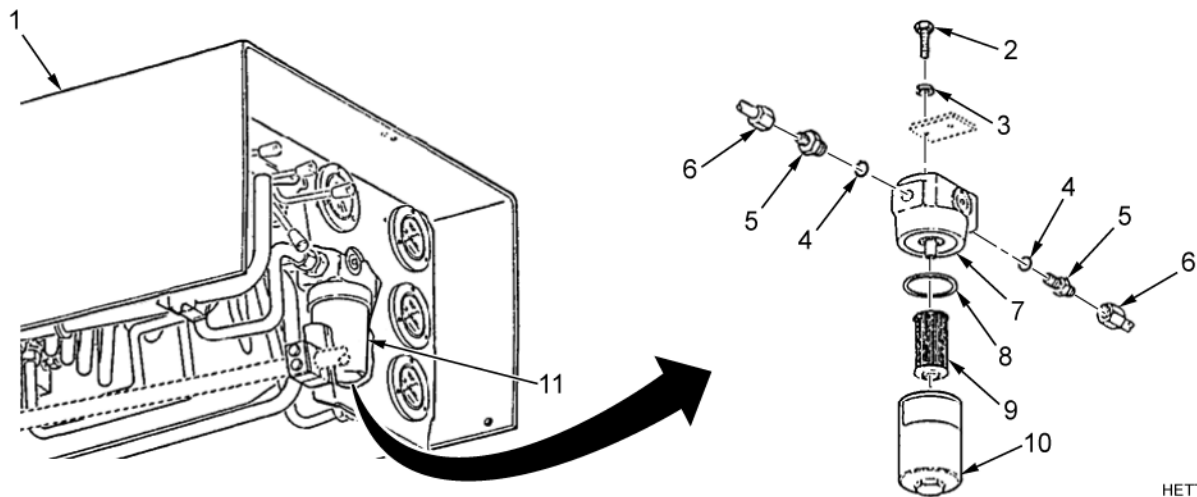


Figure 2. Hydraulic Filter Removal.

WARNING**SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
- The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound.
- Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.

Failure to follow these warnings may result in injury or death to personnel.

5. Clean filter housing with wiping rags. Clean all other components with dry cleaning solvent.
6. Inspect filter assembly for cracked or broken sight gauge, stripped threads, deformed preformed packing grooves, nicks, cracks, dents, or evidence of leakage. Replace defective components as required.

END OF TASK

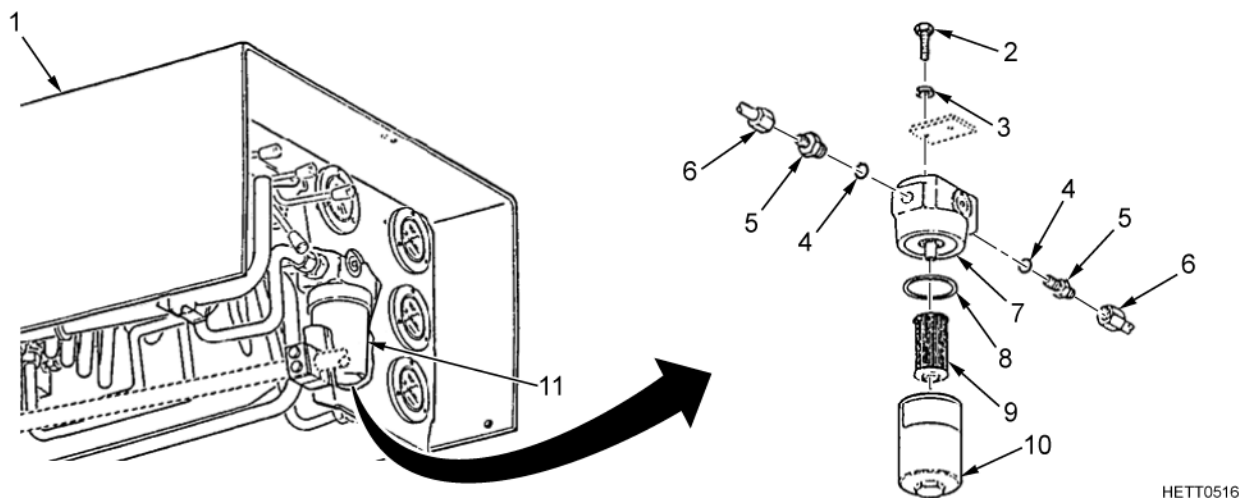
INSTALLATION

1. If hydraulic filter was not disassembled during removal, proceed to step 2. If filter was disassembled during removal, proceed as follows:
 - a. Install new filter element (Figure 3, Item 9) into filter element housing (Figure 3, Item 10). Apply a thin coat of petroleum jelly to new preformed packing (Figure 3, Item 8). Install new preformed packing onto filter block (Figure 3, Item 7).
 - b. Install filter element housing (Figure 3, Item 10), with filter element (Figure 3, Item 9) and new preformed packing (Figure 3, Item 8) attached, to filter block (Figure 3, Item 7).
 - c. Use 1 1/4 in. wrench to tighten filter element housing (Figure 3, Item 10) onto filter block (Figure 3, Item 7).
2. Remove caps/plugs and apply petroleum jelly to two new preformed packings (Figure 3, Item 4). Install new preformed packings onto two straight pipe-to-tube adapters (Figure 3, Item 5).
3. Install filter assembly (Figure 3, Item 11) onto hydraulic control module (Figure 3, Item 1) and secure with two lockwashers (Figure 3, Item 3) and bolts (Figure 3, Item 2).

CAUTION

Apply pipe sealant compound to all male threads of hydraulic pipe threads, using only enough compound to coat the threads. Do not allow compound to enter a component/fitting or the compound may restrict fluid passages and damage to equipment or equipment failure may result.

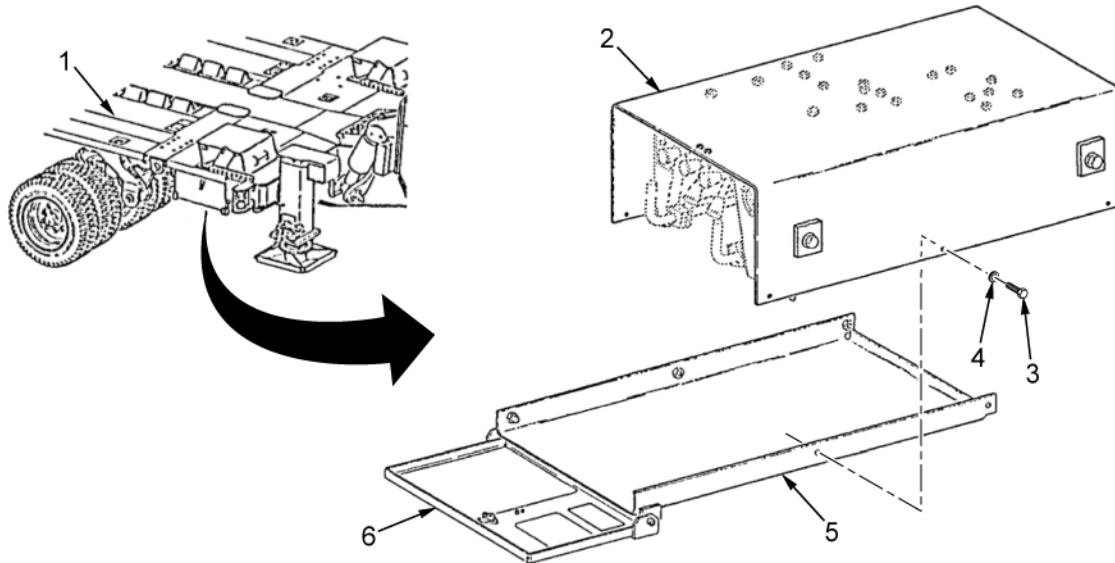
4. Remove caps/plugs and apply pipe sealant to male pipe threads of two straight adapters (Figure 3, Item 5).
5. Remove caps/plugs from two hydraulic tubes (Figure 3, Item 6) and reconnect two tubes to two straight pipe-to-tube adapters (Figure 3, Item 5).



HETT0516

Figure 3. Hydraulic Filter Installation.

6. Use two personnel to align and install lower panel (Figure 4, Item 5), with door panel (Figure 4, Item 6) attached, onto hydraulic control module (Figure 4, Item 2). Secure lower panel in place by installing six lockwashers (Figure 4, Item 4) and capscrews (Figure 4, Item 3) on underside of semitrailer platform (Figure 4, Item 1). Close door panel.



HETT0479

Figure 4. Hydraulic Filter Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Refill hydraulic tank as required (WP 0039).

Open hydraulic oil valve at reservoir (WP 0004).

Release suspension valve (hydraulic control console) to center position (WP 0004).

Perform hydraulic system bleeding as required (WP 0041).

END OF WORK PACKAGE

FIELD MAINTENANCE**GOOSENECK CYLINDER HYDRAULICS**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Petroleum Jelly (WP 0170, Item 21)
Rag, Wiping (WP 0170, Item 23)
Solvent, Dry Cleaning (WP 0170, Item 32)
Preformed Packing (4)
Preformed Packing (2)

Equipment Conditions

Suspension shutoff valve pulled out to ADJUST position (WP 0004)
Gooseneck isolation valve pulled out to ADJUST position (WP 0004)
Gooseneck lowered to lowest position (WP 0007)
Platform adjusted to 50 in. (127 cm) height (WP 0008)
Suspension isolation valves at four corners of platform closed (WP 0004)

Personnel Required

1

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the gooseneck cylinder hydraulics system.

REMOVAL**WARNING**

- Hydraulic fluid may be absorbed through the skin. Avoid prolonged exposure to skin and wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into the eyes, flush them immediately with water and seek medical attention. If hydraulic fluid gets on skin, wash thoroughly with soap and water. Wash hands thoroughly prior to eating or smoking or injury to personnel may result.
- Hydraulic fluid may be hot if system has been in operation. Allow time for system to cool before performing maintenance or injury to personnel may result.
- Residual pressure may remain in hydraulic lines. Open fittings slowly or injury to personnel may result.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or foreign material from entering the hydraulic system or damage to equipment may result.

NOTE

This procedure is for removal/installation of all gooseneck cylinder hydraulic components. Perform this procedure, or any portion of this procedure, as required to complete necessary repairs. Use the hydraulic schematic rear foldout Figure, Item FO-3 as a guide for hose routing.

1. On streetside of semitrailer (Figure 1, Item 1), remove screw (Figure 1, Item 4) and two block clamp halves (Figure 1, Item 5).
2. Tag and remove two hoses (Figure 1, Item 3) and hose (Figure 1, Item 2). Install caps/plugs into all openings.
3. Remove two straight adapters (Figure 1, Item 6), preformed packings (Figure 1, Item 7), elbow (Figure 1, Item 8), and preformed packing (Figure 1, Item 9). Install caps/plugs into all openings. Discard preformed packings.

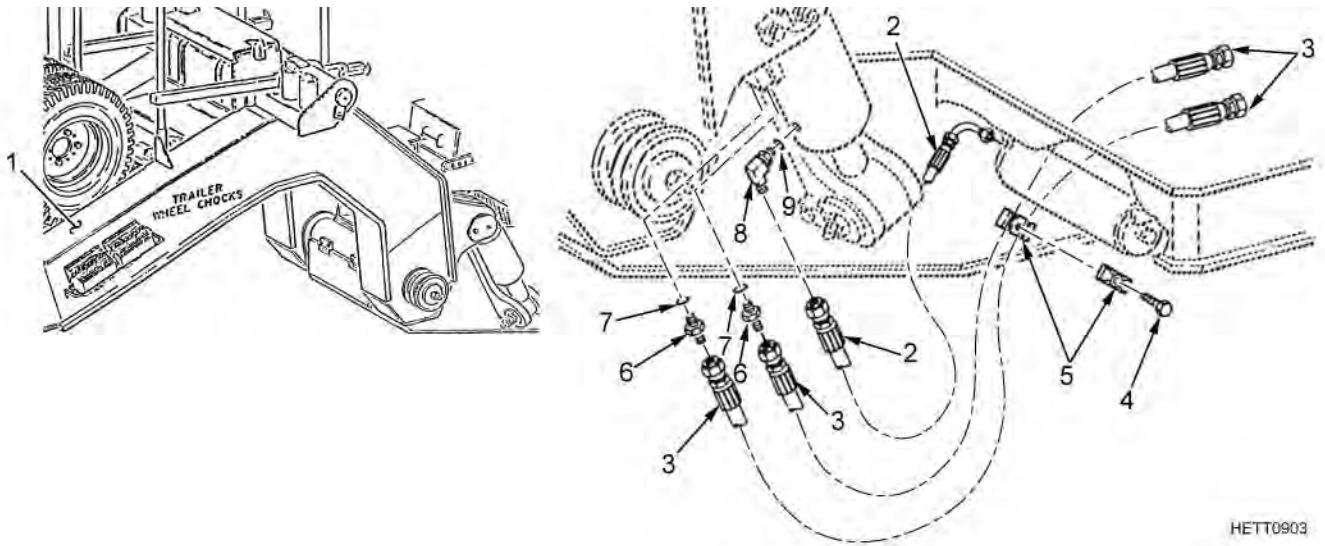


Figure 1. Streetside Gooseneck Cylinder Hydraulics Removal.

4. On curbside of semitrailer (Figure 2, Item 1), remove screw (Figure 2, Item 9) and two block clamp halves (Figure 2, Item 8).
5. Tag and remove two hoses (Figure 2, Item 2) and hose (Figure 2, Item 3). Install caps/plugs into all openings.
6. Remove two straight adapters (Figure 2, Item 7), preformed packings (Figure 2, Item 6), elbow (Figure 2, Item 5), and preformed packing (Figure 2, Item 4). Install caps/plugs into all openings. Discard preformed packings.

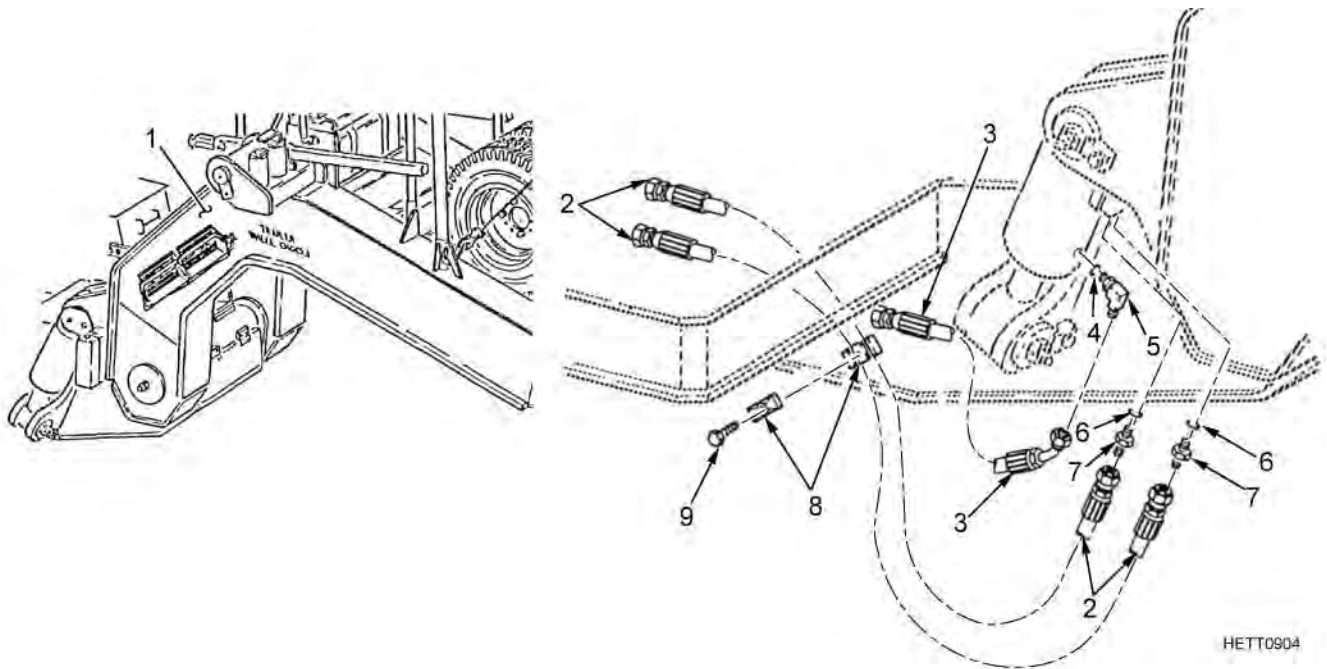


Figure 2. Curbside Gooseneck Cylinder Hydraulics Removal.

WARNING**SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
- The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound.
- Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.
- Compressed air used for cleaning/drying may create airborne particles that may injure the eyes. Always wear eye protection. Pressure must not exceed 30 psi (207 kPa) or injury to personnel may result.

Failure to follow these warnings may result in injury or death to personnel.

7. Clean inside of hoses with compressed air. Clean outside of hoses with wiping rags. Clean all other components with dry cleaning solvent.
8. Inspect hoses for kinks, splits, deterioration, chafing, cuts, and loose fittings. If hose is defective, replace hose.
9. Inspect other components for nicks, burrs, corrosion, stripped threads, and pitting. If parts are defective, replace as required.

END OF TASK

INSTALLATION

1. Remove caps/plugs. Apply petroleum jelly to new preformed packing (Figure 3, Item 4) and two new preformed packings (Figure 3, Item 6).
2. On curbside of semitrailer (Figure 3, Item 1), install new preformed packing (Figure 3, Item 4), elbow (Figure 3, Item 5), two new preformed packings (Figure 3, Item 6), and two straight adapters (Figure 3, Item 7).
3. Remove caps/plugs and install hose (Figure 3, Item 3) and two hoses (Figure 3, Item 2).
4. Install two clamp block halves (Figure 3, Item 8) and secure with screw (Figure 3, Item 9).

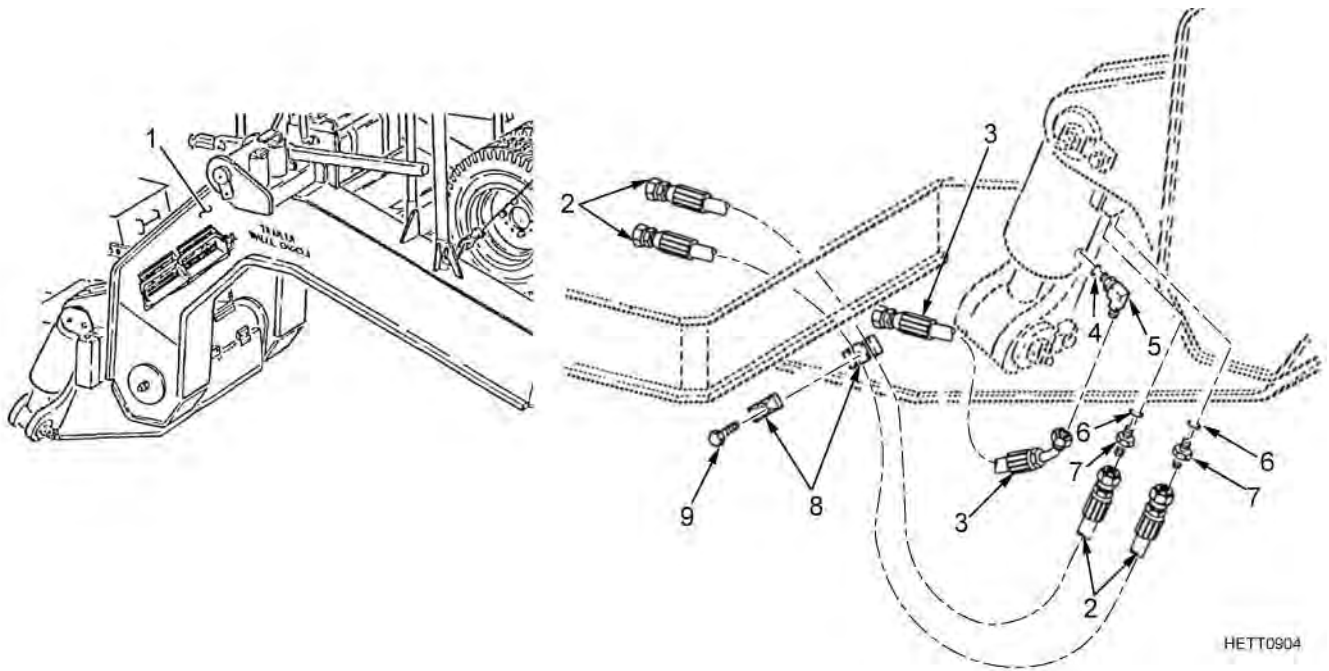


Figure 3. Curbside Gooseneck Cylinder Hydraulics Installation.

5. Remove caps/plugs. Apply petroleum jelly to new preformed packing (Figure 4, Item 9) and two new preformed packings (Figure 4, Item 7).
6. On streetside of semitrailer (Figure 4, Item 1), install new preformed packing (Figure 4, Item 9), elbow (Figure 4, Item 8), two new preformed packings (Figure 4, Item 7), and two straight adapters (Figure 4, Item 6).
7. Remove caps/plugs and install hose (Figure 4, Item 2) and two hoses (Figure 4, Item 3).
8. Install two clamp block halves (Figure 4, Item 5) and secure with screw (Figure 4, Item 4).

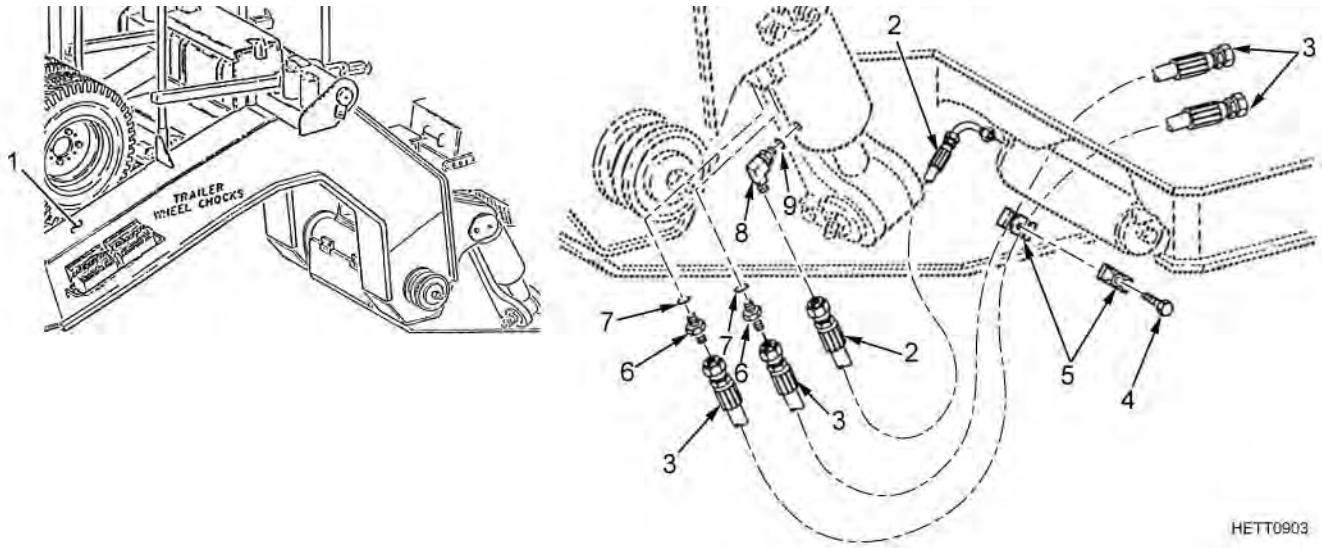


Figure 4. Streetside Gooseneck Cylinder Hydraulics Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Check/fill hydraulic tank (WP 0039).

Perform hydraulic system bleeding (WP 0041).

Operate gooseneck to check for proper operation (WP 0007).

END OF WORK PACKAGE

FIELD MAINTENANCE**GOOSENECK CYLINDER**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Lifting Strap (WP 0168, Item 25)
Truck, Wrecker M984 (WP 0168, Item 26)
Standard Army Tool Set (WP 0168, Item 28)

Bolt, 4 in. (1)

Screw, Self-Locking (1)

Bolt, Lubrication, Self-Locking (1)

Personnel Required

3

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Grease (WP 0170, Item 16)
Lockwasher (1)
Lockwasher (1)
V-Ring Seal (1)
Bolt, 2 in. (1)

Equipment Conditions

Front and rear support legs lowered supporting platform
(WP 0011 and WP 0012)

If removing curbside gooseneck cylinder, Auxiliary Power
Unit (APU) control box removed (WP 0140)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the gooseneck cylinder.

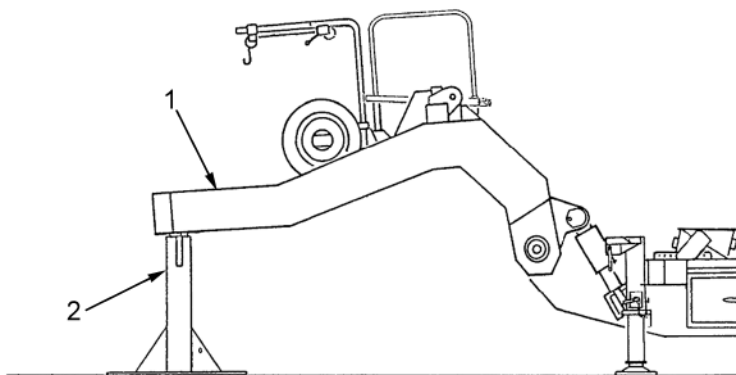
REMOVAL**WARNING**

- Gooseneck cylinder weighs in excess of 400 lb (182 kg). Ensure cylinder and gooseneck are adequately supported during removal or serious injury to personnel or damage to equipment may result.
 - Hydraulic fluid may be hot if system has been in operation. Allow time for system to cool before performing maintenance or serious injury to personnel may result.
 - Hydraulic fluid may be absorbed through the skin. Avoid prolonged exposure to skin and wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into the eyes, flush them immediately with water and seek medical attention. If hydraulic fluid gets on skin, wash thoroughly with soap and water. Wash hands thoroughly prior to eating or smoking. Failure to follow this warning may result in injury to personnel.
1. Start Auxiliary Power Unit (APU) (WP 0005).
 2. Pull out handle of suspension shutoff valve to ADJUST position (WP 0004). Be sure handle of gooseneck isolation valve is in ADJUST position (WP 0007).

NOTE

When gooseneck is lowered onto gooseneck support, both gooseneck cylinders should be almost completely extended to accommodate removal of the upper cylinder pin mounting hardware.

3. Lower gooseneck (Figure 1, Item 1) onto gooseneck support (Figure 1, Item 2) approximately 37 in. (94 cm) (WP 0007). Shut down APU (WP 0005).



HETT0650

Figure 1. Lowering Gooseneck onto Supports.

WARNING

Lifting strap must be placed around gooseneck cylinder in noose to prevent injury to personnel.

NOTE

The following steps allow for the removal of one gooseneck cylinder. Repeat steps as required to remove the other gooseneck cylinder.

4. Attach lifting strap (Figure 2, Item 4) to gooseneck cylinder (Figure 2, Item 5). Wrap lifting strap around gooseneck cylinder and through loop in strap to form slip-hook (noose).
5. Position suitable lifting device (Figure 2, Item 2) directly over top of gooseneck cylinder (Figure 2, Item 5). Lower hook (Figure 2, Item 3) of lifting device and attach end of lifting strap (Figure 2, Item 4) to lifting device.

CAUTION

DO NOT apply too much force when taking up slack or excess pressure will be applied on upper cylinder pin and removal may be complicated. Damage to equipment may result.

6. Take up slack in lifting strap (Figure 2, Item 4). Slant lifting strap toward centerline of gooseneck (Figure 2, Item 1).
7. Place drain pan (Figure 2, Item 9) under front edge of platform (Figure 2, Item 6) near cylinder hydraulic lines (Figure 2, Item 10) and valve connection points beneath platform.

WARNING

Residual pressure may remain in hydraulic lines. Open fittings slowly or injury to personnel may result.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or foreign material from entering the hydraulic system or damage to equipment may result.

NOTE

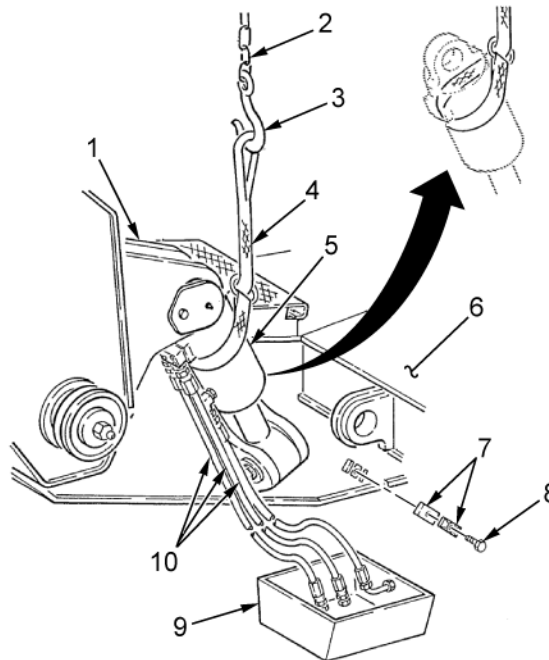
Remove small hex fitting from large hex fitting.

8. Remove screw (Figure 2, Item 8) and block clamp (Figure 2, Item 7). Tag and slowly disconnect three hydraulic lines (Figure 2, Item 10) from three hydraulic valves under platform. Install protective caps/plugs into valves only.

NOTE

Ensure ends of hydraulic lines are secured to drain pan and are pointing directly into the drain pan to prevent hydraulic fluid from spraying as the gooseneck cylinder is compressed. To prevent siphoning, do not allow ends of hoses to enter hydraulic fluid.

9. Place ends of hydraulic lines (Figure 2, Item 10) into drain pan (Figure 2, Item 9). Secure lines to drain pan using duct tape to prevent hydraulic lines from pulling out under pressure as gooseneck cylinder (Figure 2, Item 5) is compressed.



HETT0651

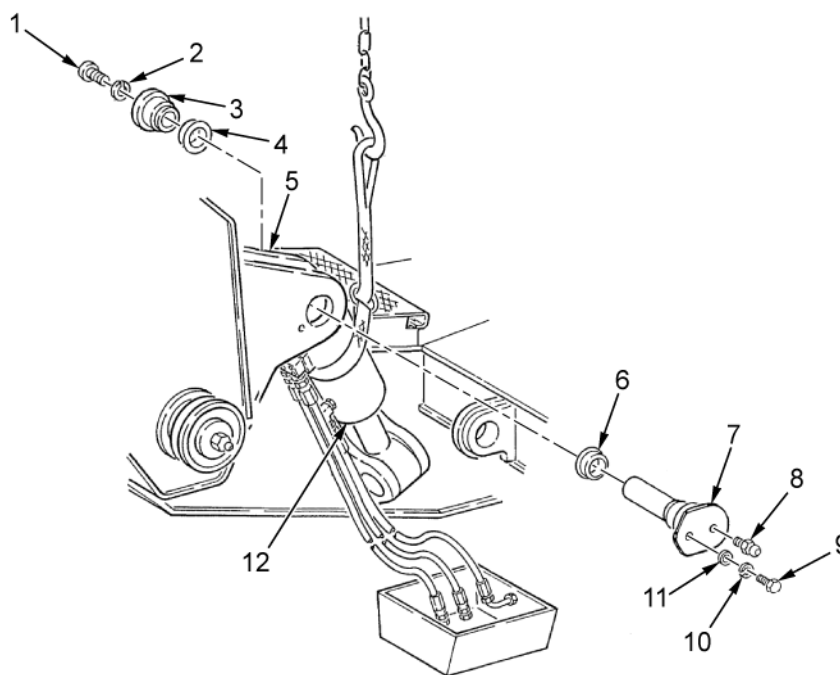
Figure 2. Gooseneck Cylinder Removal.

10. Remove screw (Figure 3, Item 1) and lockwasher (Figure 3, Item 2) if present. Remove bolt (Figure 3, Item 9), lockwasher (Figure 3, Item 10), and washer (Figure 3, Item 11). Discard screw and lockwashers.

CAUTION

Bolt must be fully engaged (bottomed out) in pin prior to striking with hammer or damage to equipment may result.

11. Install 2 in. (5.1 cm) hardened bolt into hole in upper bushing (Figure 3, Item 3). Strike bolt with hammer. When bolt no longer can be struck, remove bolt and install 4 in. (10.2 cm) hardened bolt. Drive out upper cylinder pin (Figure 3, Item 7). Remove and discard V-ring seal (Figure 3, Item 6).
12. Drive upper bushing (Figure 3, Item 3) out of gooseneck cylinder (Figure 3, Item 12) and gooseneck (Figure 3, Item 5). Remove V-ring seal (Figure 3, Item 4) from upper bushing. Discard V-ring seal.
13. Remove lubrication fitting (Figure 3, Item 8) from upper cylinder pin (Figure 3, Item 7).



HETT0652

Figure 3. Gooseneck Cylinder Removal.

14. Use crowbar to pry downward on gooseneck cylinder (Figure 4, Item 16) while lowering lifting device (Figure 4, Item 2) and allow gooseneck cylinder to start to compress. Ensure fluid from hydraulic lines (Figure 4, Item 10) is draining into drain pan (Figure 4, Item 9).
15. Continue to lower lifting device (Figure 4, Item 2) and pry downward on gooseneck cylinder (Figure 4, Item 16) until upper bearing casting (Figure 4, Item 17) on gooseneck cylinder is lower than cylinder mount (Figure 4, Item 18) on gooseneck lug (Figure 4, Item 1).
16. Ensure gooseneck cylinder (Figure 4, Item 16) is secured by keeping tension on lifting device (Figure 4, Item 2).
17. Disconnect three hydraulic lines (Figure 4, Item 10) from gooseneck cylinder (Figure 4, Item 16). Install caps/plugs into lines and gooseneck cylinder.

18. Remove screw (Figure 4, Item 3), lockwasher (Figure 4, Item 4), and washer (Figure 4, Item 5) from lower cylinder pin (Figure 4, Item 6). Remove lubrication fitting (Figure 4, Item 13), bolt (Figure 4, Item 14), and lockwashers (Figure 4, Item 15) if present. Discard bolt and lockwashers.

CAUTION

Bolt must be fully engaged (bottomed out) in pin prior to striking with hammer or damage to equipment will result.

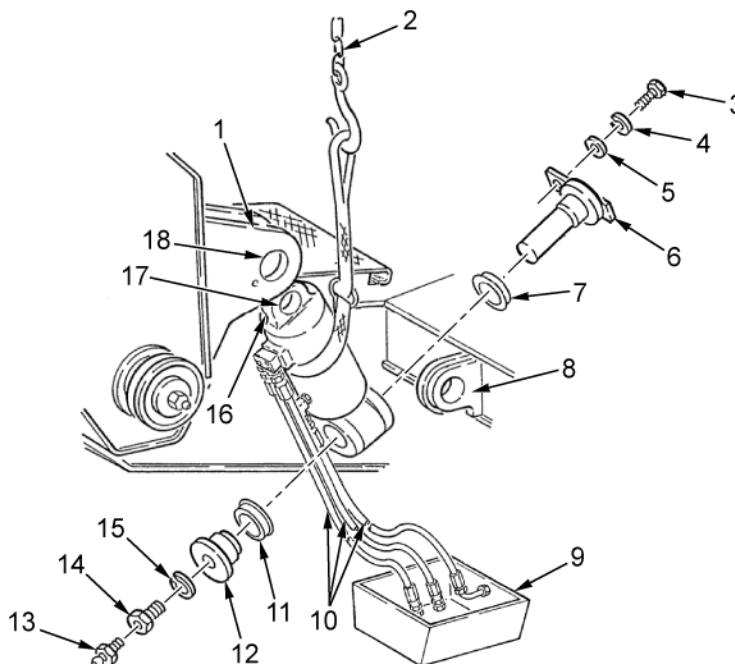
19. Install a 2 in. (5.1 cm) hardened bolt into hole in lower bushing (Figure 4, Item 12). Strike bolt with hammer. When bolt can no longer be struck, remove bolt and install a 4 in. (10.2 cm) hardened bolt. Drive out lower cylinder pin (Figure 4, Item 6). Remove and discard V-ring seal (Figure 4, Item 7).

WARNING



All personnel in area of gooseneck cylinder must stand clear of cylinder and lifting device while lifting device is repositioned or injury to personnel may result.

20. Drive lower bushing (Figure 4, Item 12) out of gooseneck cylinder (Figure 4, Item 16) and platform lug weldment (Figure 4, Item 8). Remove V-ring seal (Figure 4, Item 11) from lower bushing. Discard V-ring seal.



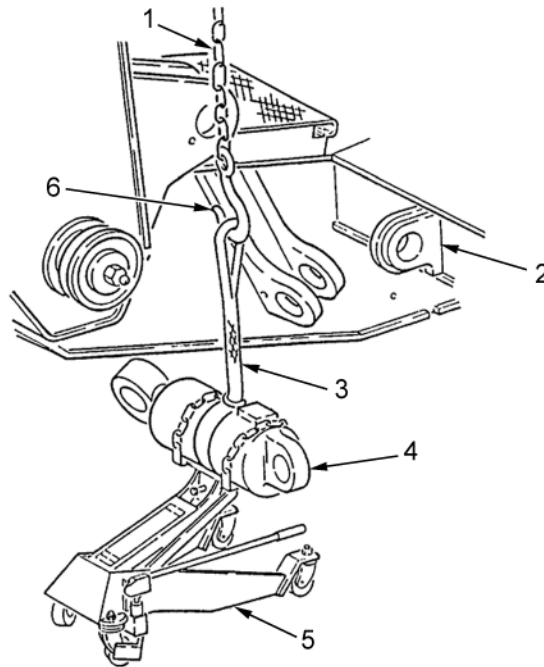
HETT0653

Figure 4. Gooseneck Cylinder Removal.

CAUTION

Top of gooseneck cylinder may start to move outward, away from platform, as lifting device is repositioned/centered over transmission jack. Lifting device operator must pay out slack to lifting strap as the lifting device is moved to prevent excess strain on lifting straps or damage to equipment may result.

21. While maintaining tension on lifting strap (Figure 5, Item 3), reposition lifting device (Figure 5, Item 1) over top of transmission jack (Figure 5, Item 5) near platform lug weldment (Figure 5, Item 2).
22. Lower lifting device (Figure 5, Item 1) until gooseneck cylinder (Figure 5, Item 4) is supported on transmission jack (Figure 5, Item 5).
23. Secure gooseneck cylinder (Figure 5, Item 4) to transmission jack (Figure 5, Item 5).
24. Loosen and remove lifting strap (Figure 5, Item 3) from hook (Figure 5, Item 6) of lifting device (Figure 5, Item 1). Leave lifting strap on gooseneck cylinder (Figure 5, Item 4).



HETT0654

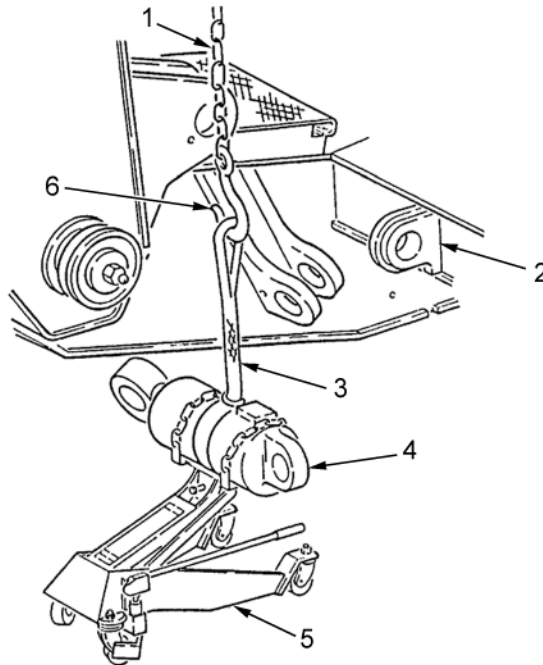
Figure 5. Gooseneck Cylinder Removal.

END OF TASK

INSTALLATION**WARNING**

Lifting strap must be placed around gooseneck cylinder in noose to prevent injury to personnel.

1. If not already installed, wrap lifting strap (Figure 6, Item 3) around gooseneck cylinder (Figure 6, Item 4) through loop to form slip-hook (noose). If necessary, secure gooseneck cylinder onto transmission jack (Figure 6, Item 5).
2. Maneuver transmission jack (Figure 6, Item 5) near platform lug weldment (Figure 6, Item 2).
3. Raise gooseneck cylinder (Figure 6, Item 4) into position, attach lifting device (Figure 6, Item 1) and hook (Figure 6, Item 6) to lifting straps (Figure 6, Item 3), and then push transmission jack (Figure 6, Item 5) out of the way.



HETT0654

Figure 6. Gooseneck Cylinder Installation.

4. Raise lifting device (Figure 7, Item 2) and install gooseneck cylinder (Figure 7, Item 13) into lug weldment (Figure 7, Item 8) of gooseneck (Figure 7, Item 1). Ensure cylinder bearings are approximately straight and ready for lower cylinder pin (Figure 7, Item 6) installation.

WARNING



- **Adhesives, solvents, and sealing compounds may burn easily, may give off harmful vapors, and are harmful to skin and clothing. Keep away from open flames and use in well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.**
- **On direct contact, uncured silicone sealant irritates eyes. In case of contact, flush eyes with water and seek medical attention. In case of skin contact, wipe off and flush with water.**

Failure to follow these warnings may result in injury or death to personnel.

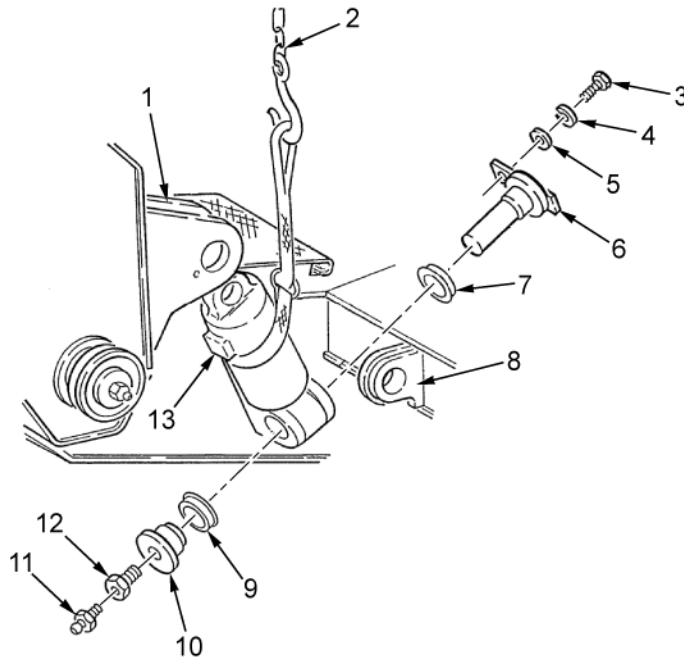
5. Apply grease to lower cylinder pin (Figure 7, Item 6) and lower bushing (Figure 7, Item 10). Install V-ring seal (Figure 7, Item 7) onto lower cylinder pin and V-ring seal (Figure 7, Item 9) onto lower bushing.
6. Hand-install lower cylinder pin (Figure 7, Item 6) through platform lug weldment (Figure 7, Item 8) until pin is partially started into lower bearing (Figure 7, Item 10) on gooseneck cylinder (Figure 7, Item 13).

CAUTION

When driving lower cylinder pin through cylinder and platform lug weldment, use caution so that the pin is driven in straight or cylinder bearing may turn the pin and cause damage to lower cylinder pin or V-ring seal.

7. Tap lower cylinder pin (Figure 7, Item 6) with hammer or heavy object until pin is through platform lug weldment (Figure 7, Item 8) and lower bearing (Figure 7, Item 10) on gooseneck cylinder (Figure 7, Item 13).

8. Align hole in end of lower cylinder pin (Figure 7, Item 6) with hole in platform lug weldment (Figure 7, Item 8) and secure lower cylinder pin with washer (Figure 7, Item 5), lockwasher (Figure 7, Item 4), and bolt (Figure 7, Item 3).
9. Install lower bushing (Figure 7, Item 10) onto lower cylinder pin (Figure 7, Item 6) and secure with self-locking lube-bolt (Figure 7, Item 12). Use torque wrench to torque self-locking lube-bolt to 100 to 110 lb-ft (136 to 149 Nm). Install lubrication fitting (Figure 7, Item 11) into self-locking lube-bolt.



HETT0655

Figure 7. Gooseneck Cylinder Installation.

CAUTION

One person must be positioned on the platform with a crowbar to prevent the gooseneck cylinder from making contact with platform step pneumatic or hydraulic lines, or damage to equipment may result.

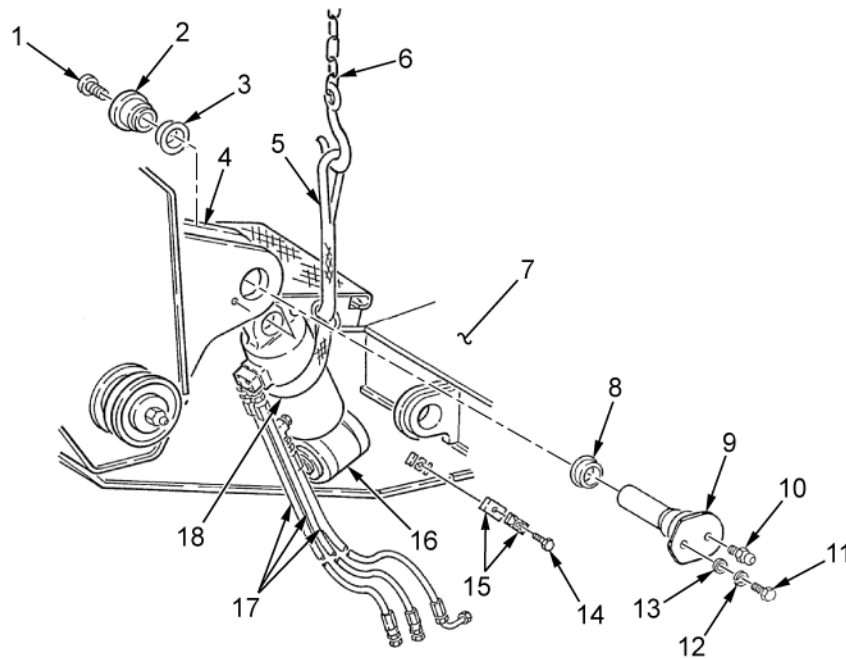
10. Position a person on the platform (Figure 8, Item 7) with crowbar to be used to prevent gooseneck cylinder (Figure 8, Item 16) from hitting platform step hydraulic or pneumatic lines located near bottom of gooseneck and platform (Figure 8, Item 7).
11. Use lifting device (Figure 8, Item 6) to raise gooseneck cylinder (Figure 8, Item 16) into gooseneck lug (Figure 8, Item 4).
12. Use crowbar and lifting device (Figure 8, Item 6) to align upper bearing (Figure 8, Item 13) of gooseneck cylinder (Figure 8, Item 16) between gooseneck lugs (Figure 8, Item 4).
13. Maintain tension on lifting strap (Figure 8, Item 5) with lifting device (Figure 8, Item 6).
14. Apply grease to upper cylinder pin (Figure 8, Item 9) and upper bushing (Figure 8, Item 2). Install a V-ring seal (Figure 8, Item 8) onto upper cylinder pin and V-ring seal (Figure 8, Item 3) onto upper bushing.
15. Hand-install upper cylinder pin (Figure 8, Item 9) through gooseneck mounting lug (Figure 8, Item 4) until pin is partially started into bearing casting (Figure 8, Item 18) on gooseneck cylinder (Figure 8, Item 16).

CAUTION

When driving upper cylinder pin through cylinder and mounting lug on gooseneck, use caution so that the pin is driven in straight or cylinder bearing may turn the pin and cause damage to upper cylinder pin or V-ring seal.

16. Drive upper cylinder pin (Figure 8, Item 9) through gooseneck mounting lug (Figure 8, Item 4) and upper bearing casting (Figure 8, Item 18) on gooseneck cylinder (Figure 8, Item 16).

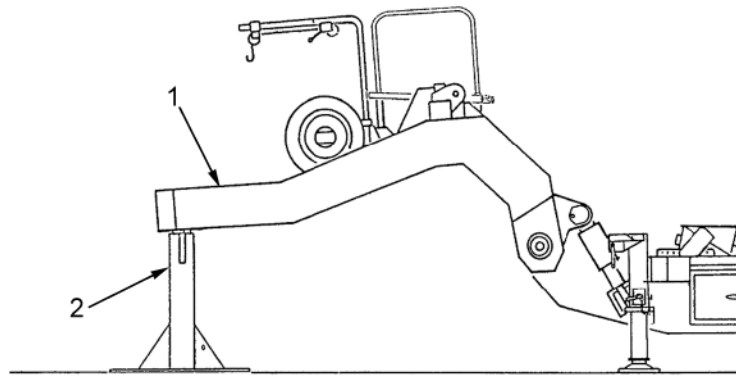
17. Align hole in end of upper cylinder pin (Figure 8, Item 9) with gooseneck mounting lug (Figure 8, Item 4) and secure upper cylinder pin with washer (Figure 8, Item 13), lockwasher (Figure 8, Item 12), and bolt (Figure 8, Item 11). Use torque wrench to torque bolt to 325 to 375 lb-ft (441 to 509 Nm).
18. Install upper bushing (Figure 8, Item 2) onto upper cylinder pin (Figure 8, Item 9) and secure with self-locking screw (Figure 8, Item 1). Use torque wrench to torque screw to 100 to 110 lb-ft (136 to 149 Nm).
19. Install lubrication fitting (Figure 8, Item 10) into upper cylinder pin (Figure 8, Item 9).
20. Lower lifting device (Figure 8, Item 6) and remove lifting strap (Figure 8, Item 5).
21. Unwrap lifting strap (Figure 8, Item 5) from gooseneck cylinder (Figure 8, Item 16).
22. Remove caps/plugs and install three hydraulic lines (Figure 8, Item 17) onto gooseneck cylinder (Figure 8, Item 16) and three hydraulic valves under platform. Install block clamp (Figure 8, Item 15) and screw (Figure 8, Item 14).



HETT0656

Figure 8. Gooseneck Cylinder Installation.

23. Refill hydraulic reservoir (WP 0039).
24. Start APU (WP 0005).
25. Operate gooseneck valve handle (WP 0004) and operate gooseneck (WP 0007) to remove air bubbles from hydraulic lines.
26. Remove gooseneck support (Figure 9, Item 2) from under gooseneck (Figure 9, Item 1).



HETT0650

Figure 9. Gooseneck Cylinder Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Refer to WP 0041 and bleed gooseneck hydraulics.

END OF WORK PACKAGE

FIELD MAINTENANCE**HYDRAULIC TANK FILTER**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)

Materials/Parts

Solvent, Dry Cleaning (WP 0170, Item 32)

Personnel Required

1

Equipment Conditions

Hydraulic tank assembly disassembled (WP 0126)

GENERAL INFORMATION

This work package contains instructions for the removal, repair, and installation of the hydraulic tank filter.

REMOVAL**WARNING**

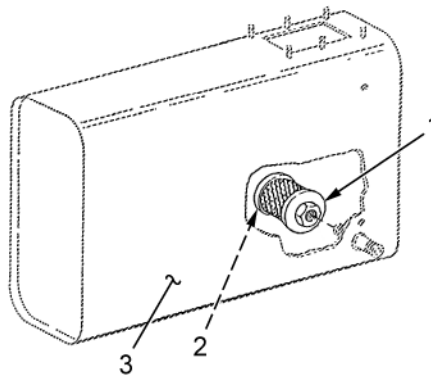
- Hydraulic fluid may be absorbed through the skin. Avoid prolonged exposure to skin and wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets in the eyes, flush them immediately with water and seek medical attention. If hydraulic fluid gets on skin, wash thoroughly with soap and water. Wash hands thoroughly prior to eating or smoking.
- Hydraulic fluid may be hot if system has been in operation. Allow time for system to cool before performing maintenance.

Failure to follow these warnings may result in injury or death to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or foreign material from entering the hydraulic system or damage to equipment may result.

1. Use an automotive adjustable wrench to unscrew and remove hydraulic tank filter (Figure 1, Item 1) from fitting (Figure 1, Item 2) inside of hydraulic tank (Figure 1, Item 3).



HETT0518

Figure 1. Hydraulic Tank Filter Removal.

END OF TASK

REPAIR

WARNING**SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
- The flashpoint for Type II solvent cleaning compound is 141° to 198°F (61° to 92°C) and for Type III it is 200° to 241°F (93° to 116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound.
- Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.

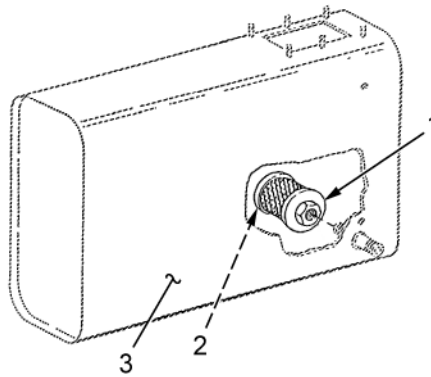
Failure to follow these warnings may result in injury or death to personnel.

1. Clean hydraulic filter with dry cleaning solvent and dry with compressed air.
2. Inspect hydraulic filter for holes, corrosion, clogging, or evidence of collapse. Replace filter if required.

END OF TASK

INSTALLATION

1. Use an automotive adjustable wrench to thread hydraulic filter (Figure 2, Item 1) onto fitting (Figure 2, Item 2) inside hydraulic tank (Figure 2, Item 3).



HETT0518

Figure 2. Hydraulic Tank Filter Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Assemble hydraulic tank assembly (WP 0126).

END OF WORK PACKAGE

FIELD MAINTENANCE**PLATFORM SUSPENSION HYDRAULICS**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (SATS) (WP 0168, Item 28)

Self-Locking Nut (2) (TM 9-2330-381-24P)

Self-Locking Nut (2) (TM 9-2330-381-24P)

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Petroleum Jelly (WP 0170, Item 21)
Pipe Sealant (WP 0170, Item 22)
Rag, Wiping, Cotton, and Cotton Synthetic (WP 0170, Item 23)
Solvent, Dry Cleaning (WP 0170, Item 32)
Strap, Tiedown, Electrical (WP 0170, Item 33)
Preformed Packing (20) (TM 9-2330-381-24P)
Preformed Packing (7) (TM 9-2330-381-24P)

Equipment Conditions

Gooseneck lowered to lowest position, if uncoupled (WP 0007)

Front support legs lowered supporting platform (WP 0011)

Rear support legs lowered supporting platform (WP 0012)

Platform lowered onto support legs to relieve all pressure on suspension gauges (WP 0008)

Gooseneck isolation and suspension isolation SHUTOFF valves pulled out to ADJUST position (WP 0004)

GENERAL INFORMATION

This work package provides instructions for the removal, repair, and installation of the platform suspension hydraulics.

REMOVAL

WARNING

- Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into eyes, flush immediately with water and seek medical attention. If hydraulic fluid gets on skin, wash thoroughly with soap and water. Wash hands thoroughly prior to eating or smoking.
- Hydraulic fluid may be hot if system has been in operation. Allow time to cool before performing maintenance.
- Residual pressure may remain in hydraulic lines. Open fittings slowly.

Failure to follow these warnings may result in injury or death to personnel.

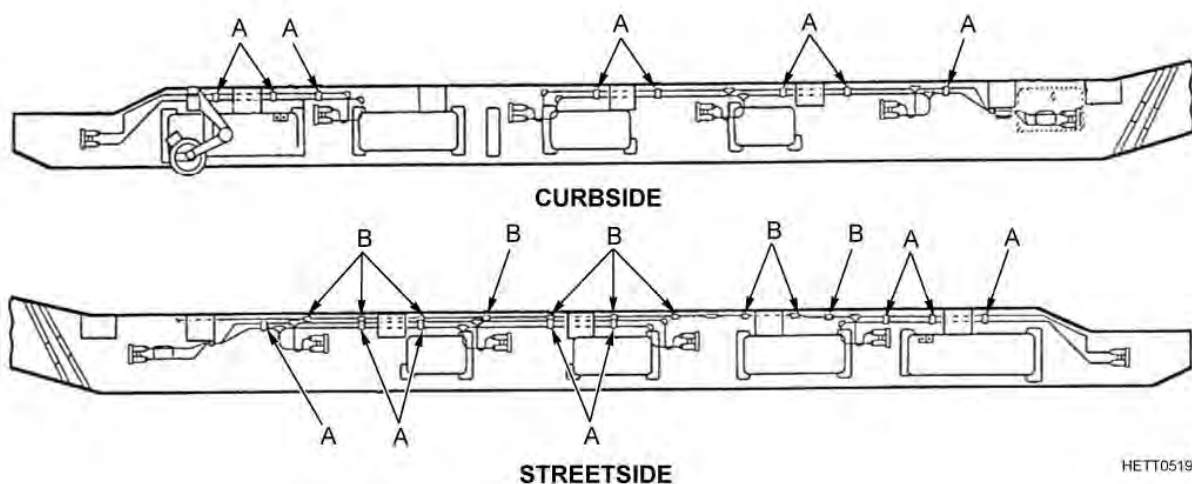
CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or foreign material from entering the hydraulic system, or damage to equipment may result.

NOTE

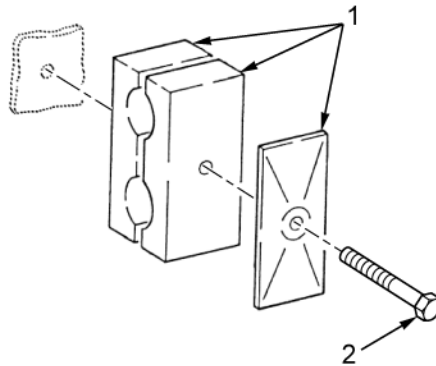
This procedure is for removal/installation of all platform suspension hydraulics components. Perform this procedure, or any portion of this procedure, as required to complete the necessary repair. Use the hydraulic schematic shown in Figure 1 as a guide for hose routing.

1. At 16 places (Figure 1, Item A), eight curbside and eight streetside, remove screw (Figure 2, Item 2) and block clamp (Figure 2, Item 1).



HETT0519

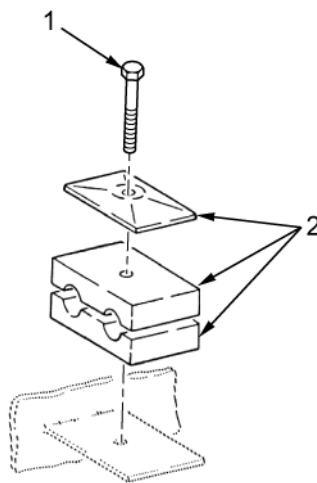
Figure 1. Hydraulic Hose Routing.

REMOVAL - Cont.

HETT0824

Figure 2. Block Clamp A Removal.

2. At ten places (Figure 1, Item B), streetside, remove screw (Figure 3, Item 1) and block clamp (Figure 3, Item 2).

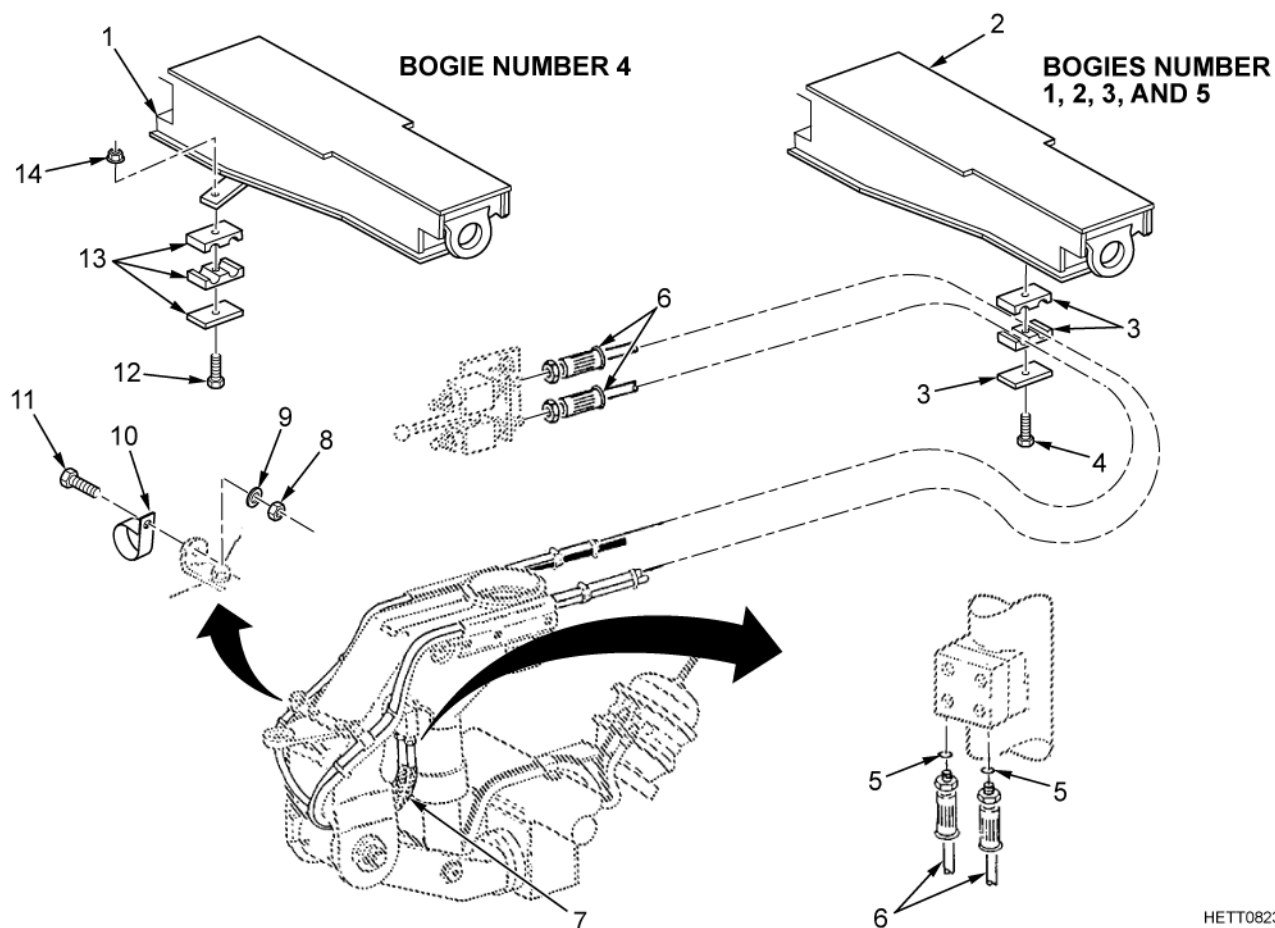


HETT0825

Figure 3. Block Clamp B Removal.

REMOVAL - Cont.

3. Remove from bogies Nos. 1, 2, 3, and 5 (Figure 4, Item 2), screw (Figure 4, Item 4) and block clamp (Figure 4, Item 3).
4. Remove tiedown straps as required. Remove two self-locking nuts (Figure 4, Item 8), washers (Figure 4, Item 9), screws (Figure 4, Item 11), and clamps (Figure 4, Item 10). Discard tiedown straps and self-locking nuts.
5. Remove two hose shields (WP 0066).
6. Tag and remove two hoses (Figure 4, Item 6) and preformed packing (Figure 4, Item 5). Remove loom (Figure 4, Item 7) from two hoses (Figure 4, Item 6). Install caps/plugs in all openings. Discard preformed packing.
7. At curbside and streetside bogie No. 4 (Figure 4, Item 1), remove nut (Figure 4, Item 14), screw (Figure 4, Item 12), and block clamp (Figure 4, Item 13).
8. Remove tiedown straps as required. Remove two self-locking nuts (Figure 4, Item 8), washers (Figure 4, Item 9), screws (Figure 4, Item 11), and clamps (Figure 4, Item 10). Discard tiedown straps and self-locking nuts.
9. Remove two hose shields (WP 0066).
10. Tag and remove two hoses (Figure 4, Item 6) and preformed packing (Figure 4, Item 5). Remove loom (Figure 4, Item 7) from two hoses. Install caps/plugs in all openings. Discard preformed packing.



HETT0823

Figure 4. Bogies Nos. 1, 2, 3, 4, and 5 Removal.

REMOVAL - Cont.

11. At curbside No. 1 bogie, tag and remove two tubes (Figure 5, Item 1 and Item 3) and tube tees (Figure 5, Item 2). Install caps/plugs in all openings.

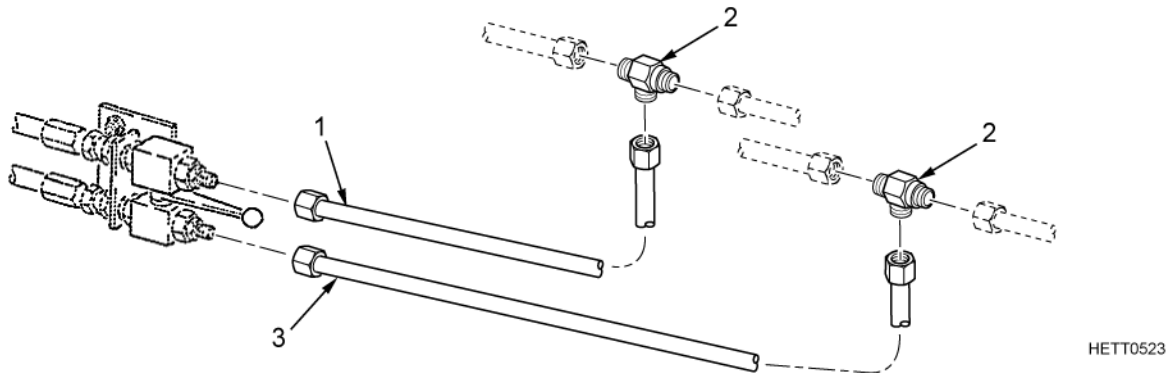


Figure 5. Curbside No. 1 Bogie Removal.

12. At curbside No. 2 bogie, tag and remove two tubes (Figure 6, Item 1 and Item 4), tubes (Figure 6, Item 3), and tube tees (Figure 6, Item 2). Install caps/plugs in all openings.

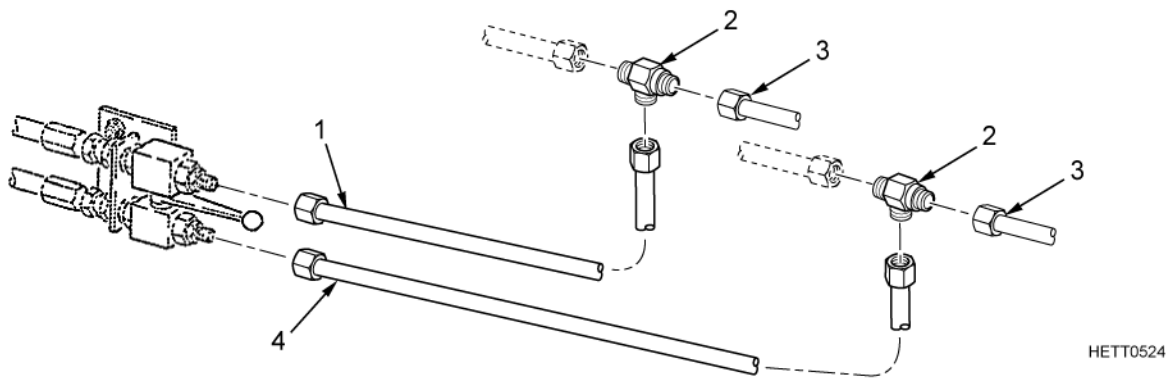


Figure 6. Curbside No. 2 Bogie Removal.

13. At curbside No. 3 bogie, tag and remove two tubes (Figure 7, Item 1 and Item 4), tubes (Figure 7, Item 3), and elbows (Figure 7, Item 2). Install caps/plugs in all openings.

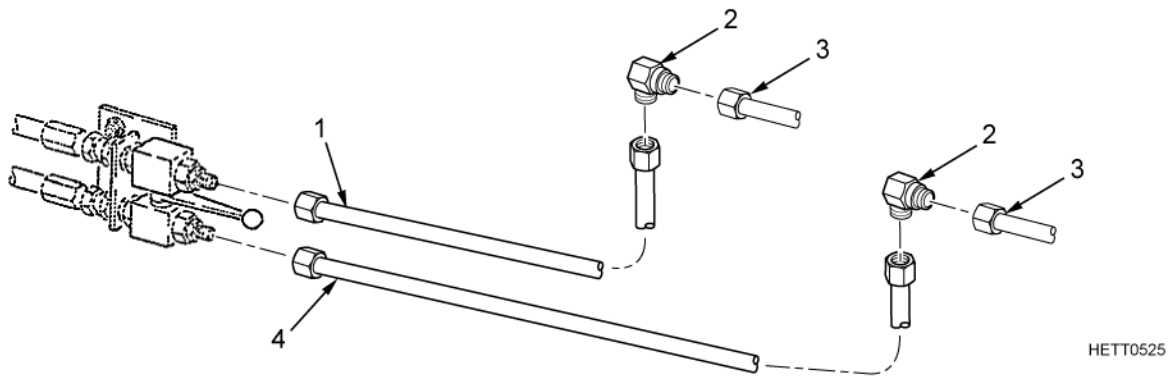


Figure 7. Curbside No. 3 Bogie Removal.

REMOVAL - Cont.

14. At curbside No. 4 bogie, tag and remove two tubes (Figure 8, Item 1 and Item 4), tubes (Figure 8, Item 2), and elbows (Figure 8, Item 3). Install caps/plugs in all openings.

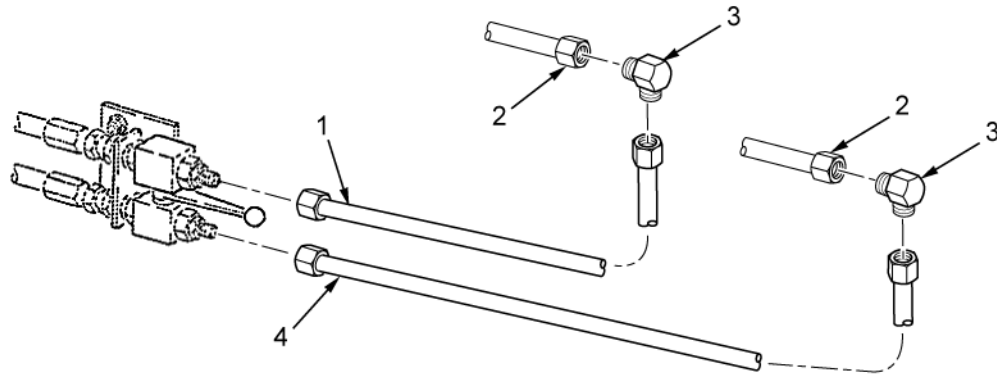


Figure 8. Curbside No. 4 Bogie Removal.

15. At curbside No. 5 bogie, tag and remove two tubes (Figure 9, Item 1 and Item 2). Install caps/plugs in all openings.

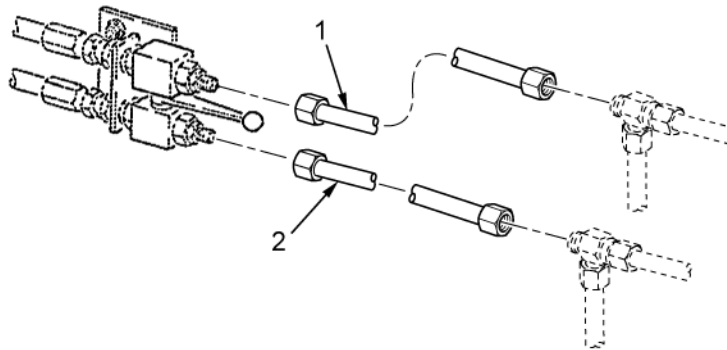
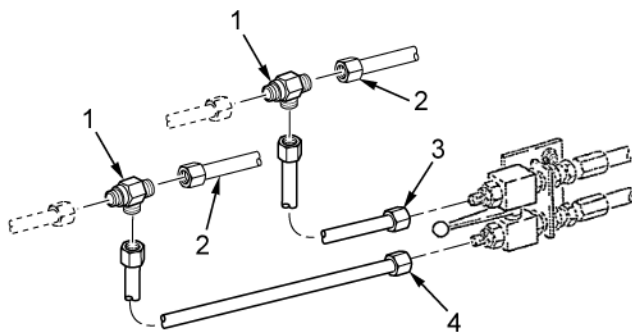
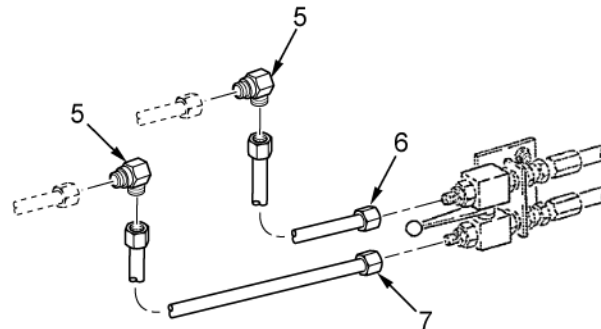
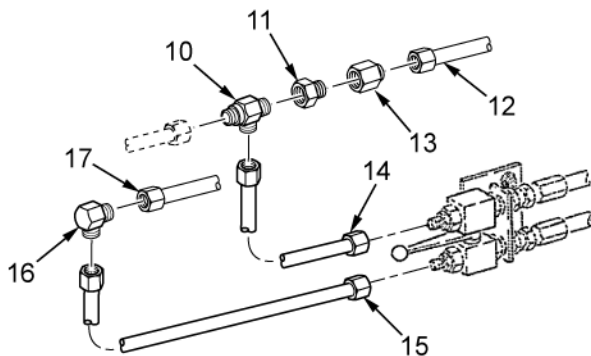
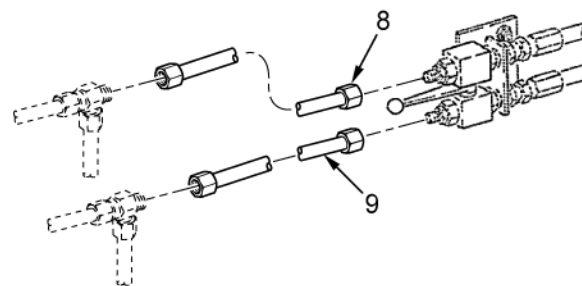


Figure 9. Curbside No. 5 Bogie Removal.

REMOVAL - Cont.

16. At streetside bogies Nos. 1 and 2, tag and remove two tubes (Figure 10, Item 3 and Item 4), tubes (Figure 10, Item 2), and tube tees (Figure 10, Item 1). Install caps/plugs in all openings.
17. At streetside bogie No. 3, tag and remove two tubes (Figure 10, Item 6 and Item 7) and elbows (Figure 10, Item 5). Install caps/plugs in all openings.
18. At streetside bogie No. 4, tag and remove three tubes (Figure 10, Item 14, Item 15, and Item 17), elbow (Figure 10, Item 16), tube (Figure 10, Item 12), coupling nut (Figure 10, Item 13), reducer (Figure 10, Item 11), and tee (Figure 10, Item 10). Install caps/plugs in all openings.
19. At streetside bogie No. 5, tag and remove two tubes (Figure 10, Item 8 and Item 9). Install caps/plugs in all openings.

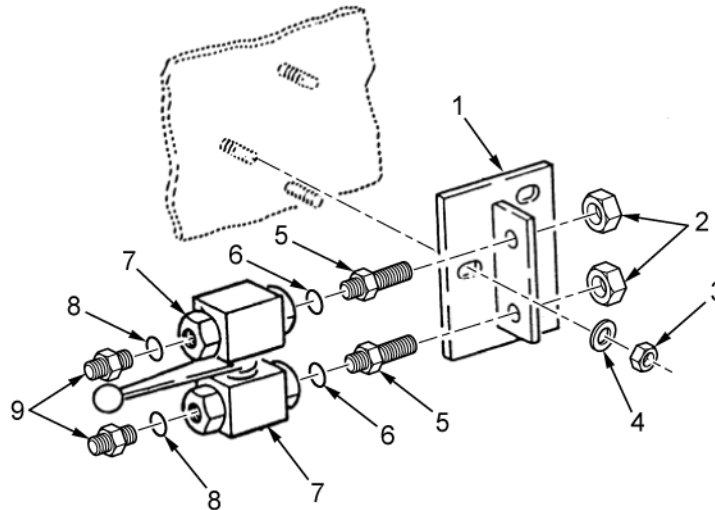
**STREETSIDE BOGIES NUMBER 1 AND 2****STREETSIDE BOGIE NUMBER 3****STREETSIDE BOGIE NUMBER 4****STREETSIDE BOGIE NUMBER 5**

HETT0528

Figure 10. Streetside Bogies 1 thru 5 Removal.

REMOVAL - Cont.

20. Just aft of each bogie, curbside and streetside, remove two straight adapters (Figure 11, Item 9) and preformed packing (Figure 11, Item 8) from suspension isolation valve assembly (Figure 11, Item 7). Remove two nuts (Figure 11, Item 2), nipples (Figure 11, Item 5), preformed packing (Figure 11, Item 6), and suspension isolation valve assembly (Figure 11, Item 7). Remove three self-locking nuts (Figure 11, Item 3), washers (Figure 11, Item 4), and T-bracket (Figure 11, Item 1). Install caps/plugs in all openings. Discard preformed packing and self-locking nuts.

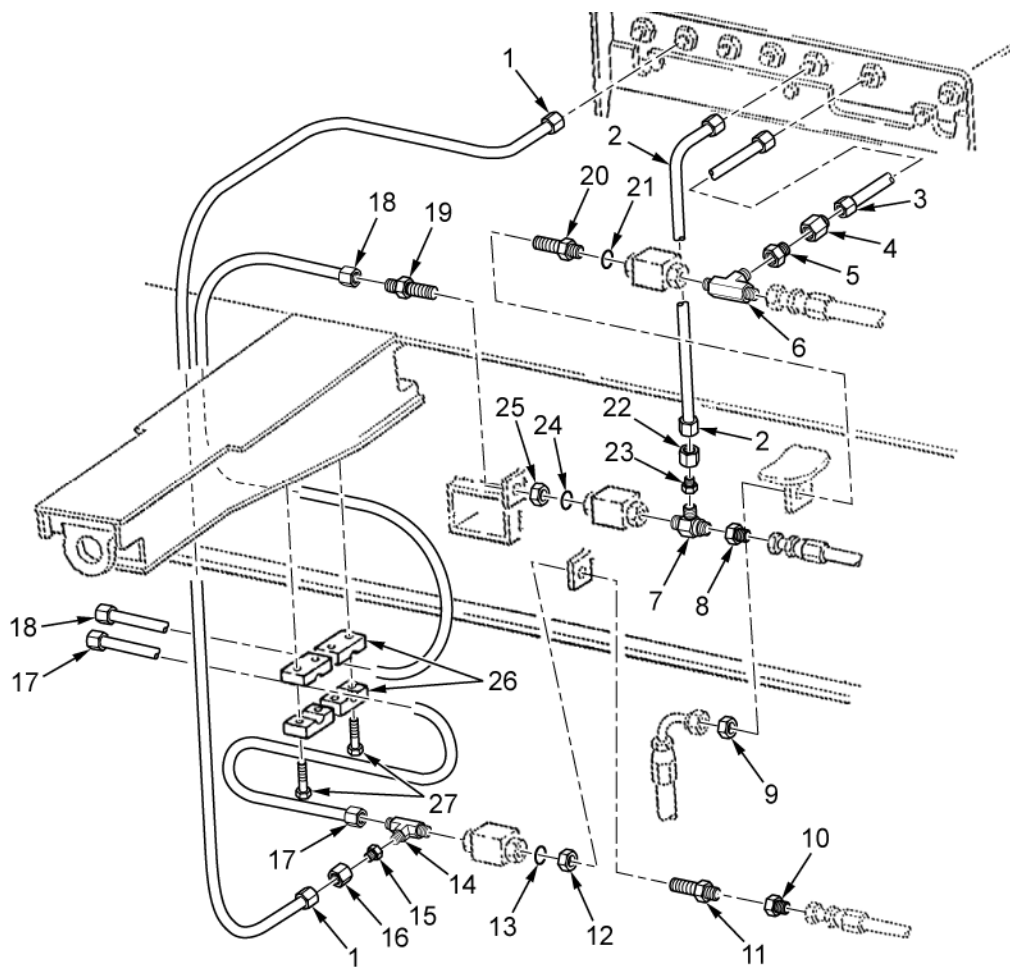


HETT0529

Figure 11. Suspension Isolation Valve Assembly Removal.

REMOVAL - Cont.

21. At curbside front, remove four screws (Figure 12, Item 27) and two block clamps (Figure 12, Item 26).
22. Tag and remove three tubes (Figure 12, Item 1, Item 17, and Item 18), coupling nut (Figure 12, Item 16), reducer (Figure 12, Item 15), and tee (Figure 12, Item 14). Install caps/plugs in all openings.
23. Remove reducer (Figure 12, Item 10), tube nipple (Figure 12, Item 11), nut (Figure 12, Item 12), and preformed packing (Figure 12, Item 13). Install caps/plugs in all openings. Discard preformed packing.
24. Tag and remove tube (Figure 12, Item 2), coupling nut (Figure 12, Item 22), reducer (Figure 12, Item 23), reducer (Figure 12, Item 8), tee (Figure 12, Item 7), nut (Figure 12, Item 25), preformed packing (Figure 12, Item 24), and tube nipple (Figure 12, Item 19). Install caps/plugs in all openings. Discard preformed packing.
25. Remove nut (Figure 12, Item 9), tube nipple (Figure 12, Item 20), and preformed packing (Figure 12, Item 21). Install caps/plugs in all openings. Discard preformed packing.
26. Tag and remove tube (Figure 12, Item 3), coupling nut (Figure 12, Item 4), reducer (Figure 12, Item 5), and tee (Figure 12, Item 6). Install caps/plugs in all openings.

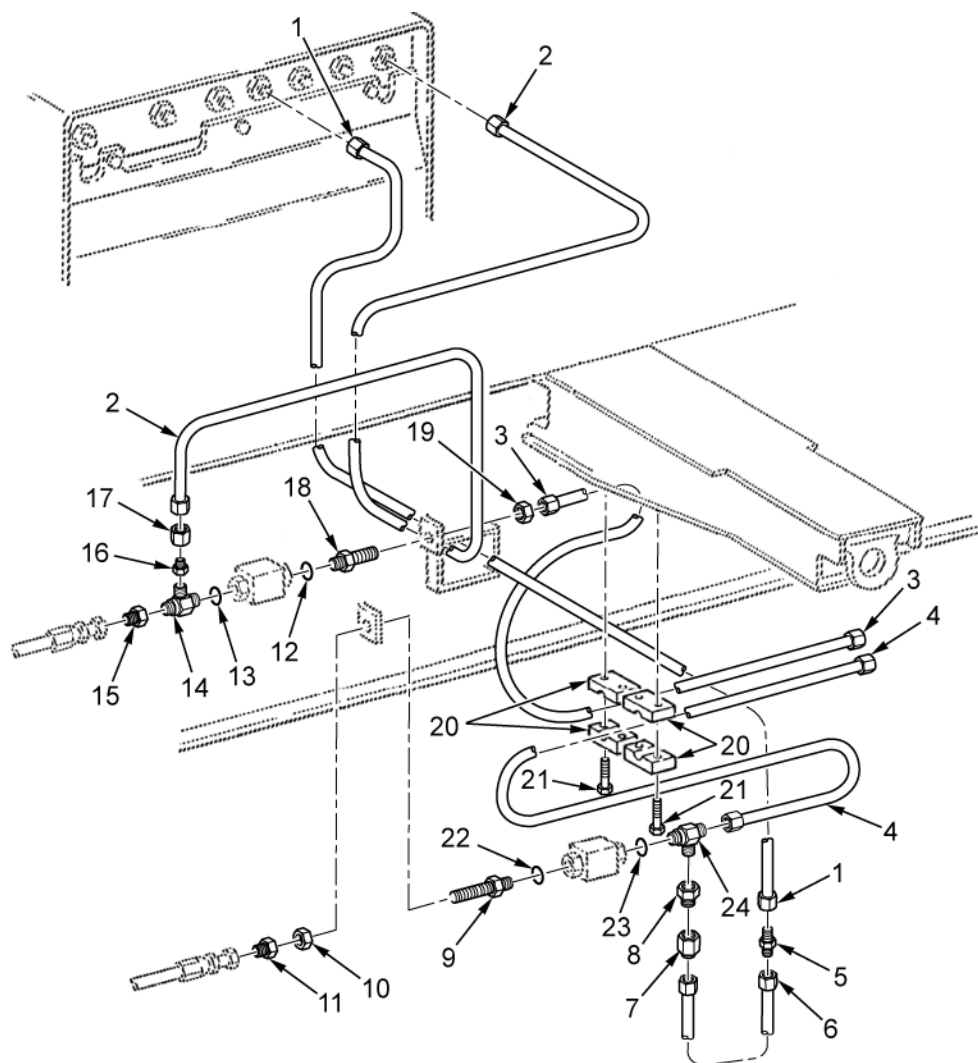


HETT0530

Figure 12. Curbside Tubing Removal.

REMOVAL - Cont.

27. At streetside front, remove four screws (Figure 13, Item 21) and two block clamps (Figure 13, Item 20).
28. Tag and remove four tubes (Figure 13, Item 4, Item 3, Item 6, and Item 1).
29. Remove tube nipple (Figure 13, Item 5), coupling nut (Figure 13, Item 7), reducer (Figure 13, Item 8), tee (Figure 13, Item 24), and preformed packing (Figure 13, Item 23).
30. Remove reducer (Figure 13, Item 11), nut (Figure 13, Item 10), tube nipple (Figure 13, Item 9), and preformed packing (Figure 13, Item 22). Install caps/plugs in all openings. Discard preformed packing.
31. Tag and remove tube (Figure 13, Item 2).
32. Remove coupling nut (Figure 13, Item 17), reducer (Figure 13, Item 16), reducer (Figure 13, Item 15), tee (Figure 13, Item 14), and preformed packing (Figure 13, Item 13).
33. Remove nut (Figure 13, Item 19), tube nipple (Figure 13, Item 18), and preformed packing (Figure 13, Item 12). Install caps/plugs in all openings. Discard preformed packing.

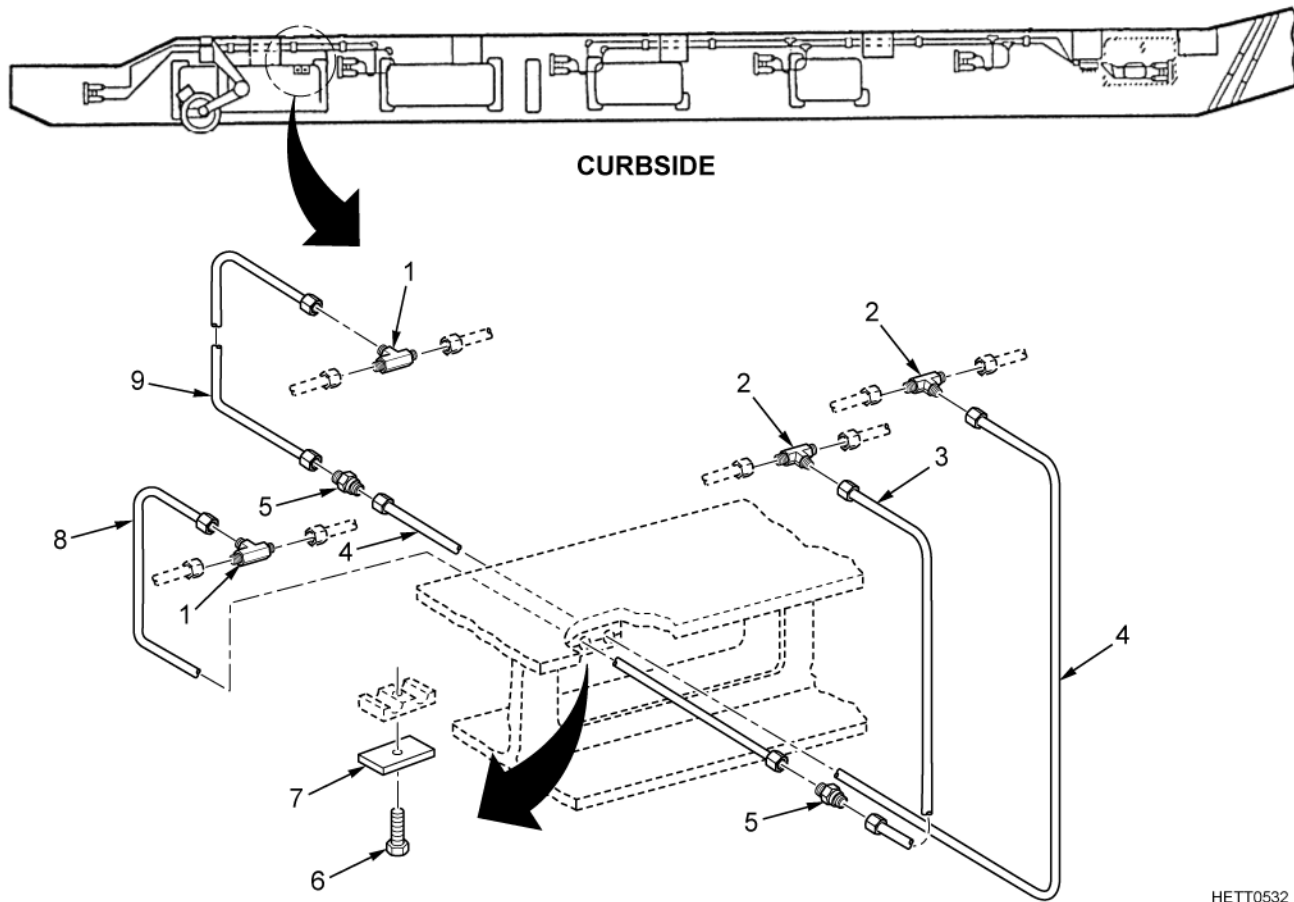


HETT0531

Figure 13. Streetside Front Tubing Removal.

REMOVAL - Cont.

34. At curbside, remove screw (Figure 14, Item 6) and block clamp (Figure 14, Item 7). Tag and remove two tubes (Figure 14, Item 8 and Item 9) and tube tees (Figure 14, Item 1). Install caps/plugs in all openings.
35. Tag and remove two tubes (Figure 14, Item 3 and Item 4), tube tees (Figure 14, Item 2), and adapters (Figure 14, Item 5). Install caps/plugs in all openings.

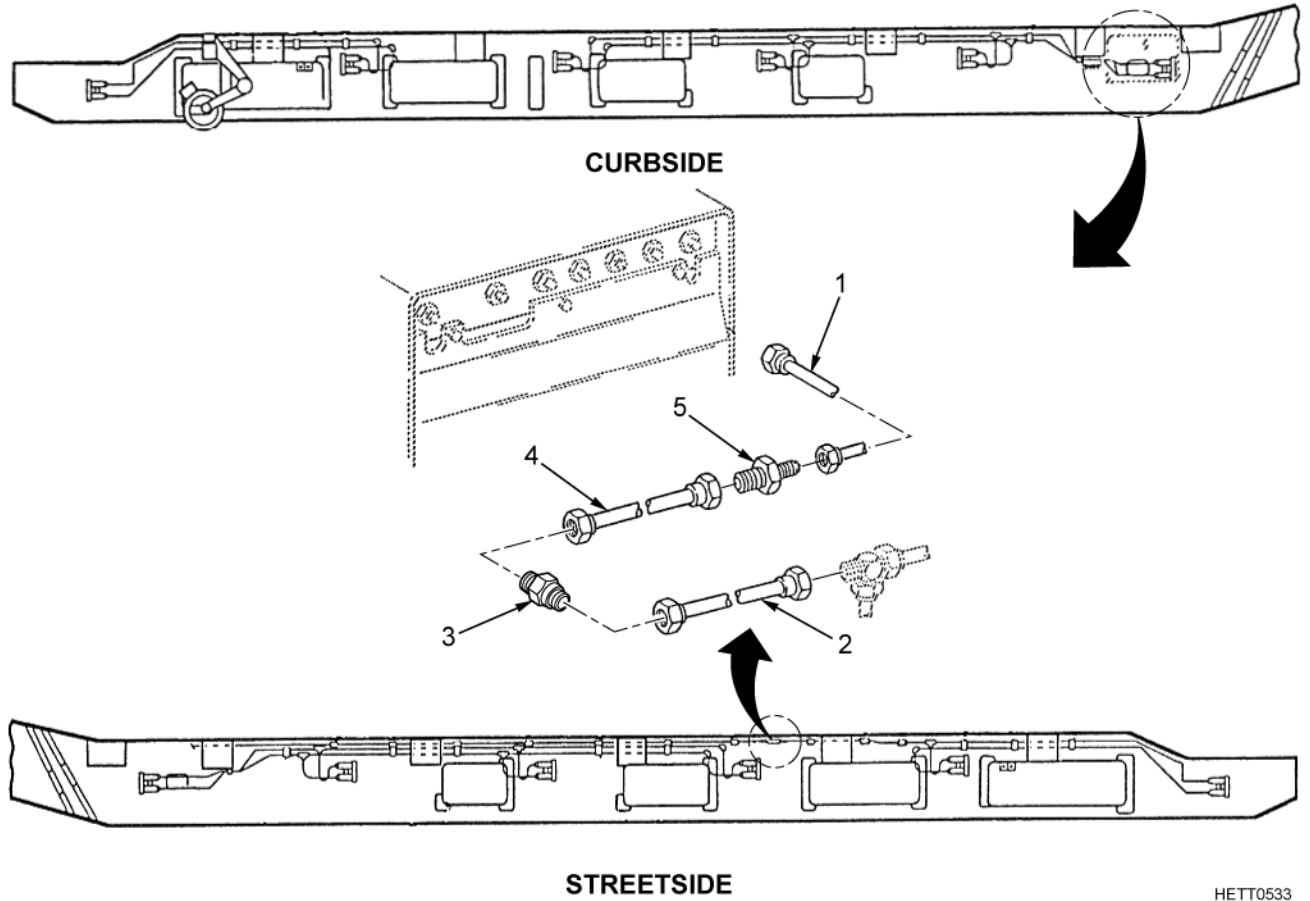


HETT0532

Figure 14. Curbside Tubing Removal.

REMOVAL - Cont.

36. Tag and remove tube (Figure 15, Item 2), tube nipple (Figure 15, Item 3), tube (Figure 15, Item 4), reducer (Figure 15, Item 5), and tube (Figure 15, Item 1). Install caps/plugs in all openings.



HETT0533

Figure 15. Curbside/Streetside Tubing Removal.

END OF TASK

REPAIR

WARNING**SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
- The flashpoint for Type II solvent cleaning compound is 141° to 198°F (61° to 92°C) and for Type III it is 200° to 241°F (93° to 116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound.
- Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.
- Compressed air used for cleaning/drying may create airborne particles that may injure unprotected eyes. Always wear eye protection. Pressure must not exceed 30 psi (207 kPa) or injury to personnel may result.

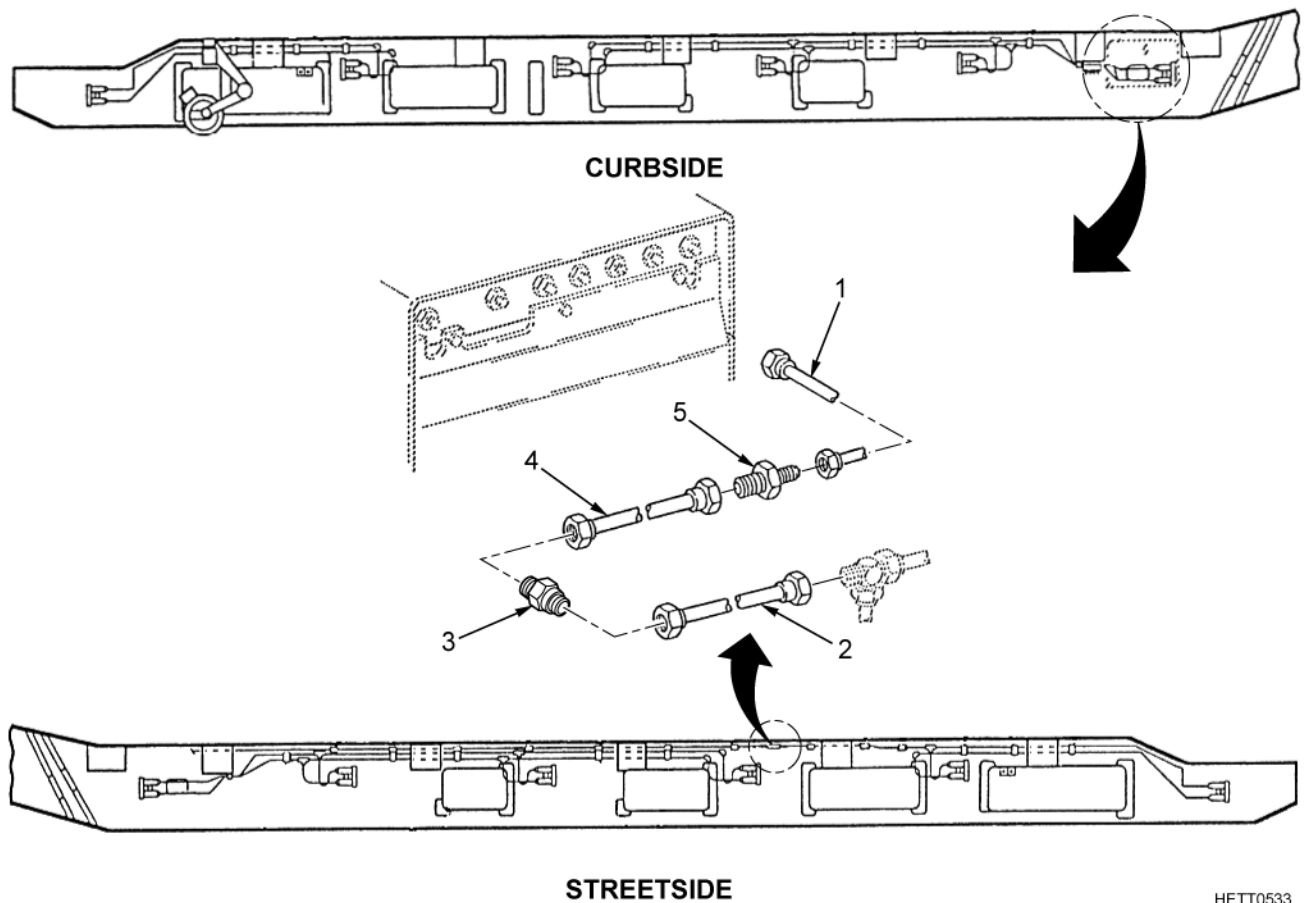
Failure to follow these warnings may result in injury or death to personnel.

1. Clean inside of hoses with compressed air. Clean outside of hoses with wiping rags. Clean all other components with dry cleaning solvent.
2. Inspect hoses for kinks, splits, deterioration, chafing, cuts, and loose fittings. If hose is defective, replace hose.
3. Inspect tubes for kinks, deterioration, chafing, gouges, and loose fittings. If tube is damaged, replace tube.
4. Inspect other components for nicks, burrs, corrosion, stripped threads, broken castings, and pitting. If parts are defective, replace as required.

END OF TASK

INSTALLATION**CAUTION**

- Apply pipe sealant compound to all male pipe threads of hydraulic fitting, using only enough compound to coat the threads. **DO NOT** allow the compound to enter a component/fitting or the compound may restrict fluid passages and damage to equipment or equipment failure may result.
 - Note positioning/orientation of fittings on the illustrations. It is important to have the tightened fitting positioned as shown so that hoses are not too short and fittings **DO NOT** interfere with one another, or damage to equipment may result.
1. At curbside, remove caps/plugs. Apply pipe sealant to male threads. Install tube (Figure 16, Item 1), reducer (Figure 16, Item 5), tube (Figure 16, Item 4), tube nipple (Figure 16, Item 3), and tube (Figure 16, Item 2).



HETT0533

Figure 16. Curbside Tubing Installation.

INSTALLATION - Cont.

2. Remove caps/plugs. Apply pipe sealant to male threads. Install two adapters (Figure 17, Item 5), tube tees (Figure 17, Item 2), and tubes (Figure 17, Item 4 and Item 3).
3. Remove caps/plugs. Apply pipe sealant to male threads. Install two tube tees (Figure 17, Item 1) and tubes (Figure 17, Item 9 and Item 8). Install block clamp (Figure 17, Item 7) and screw (Figure 17, Item 6).

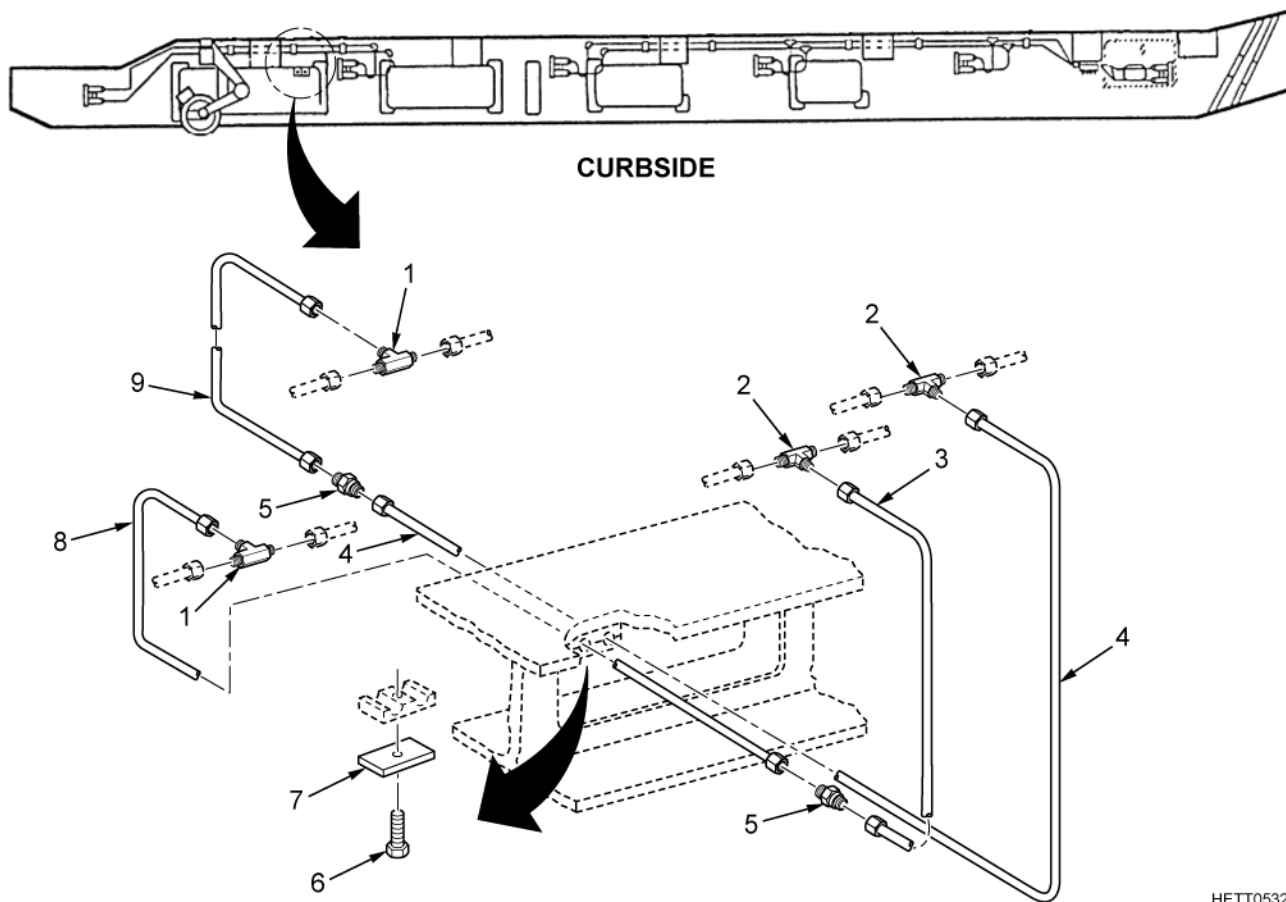
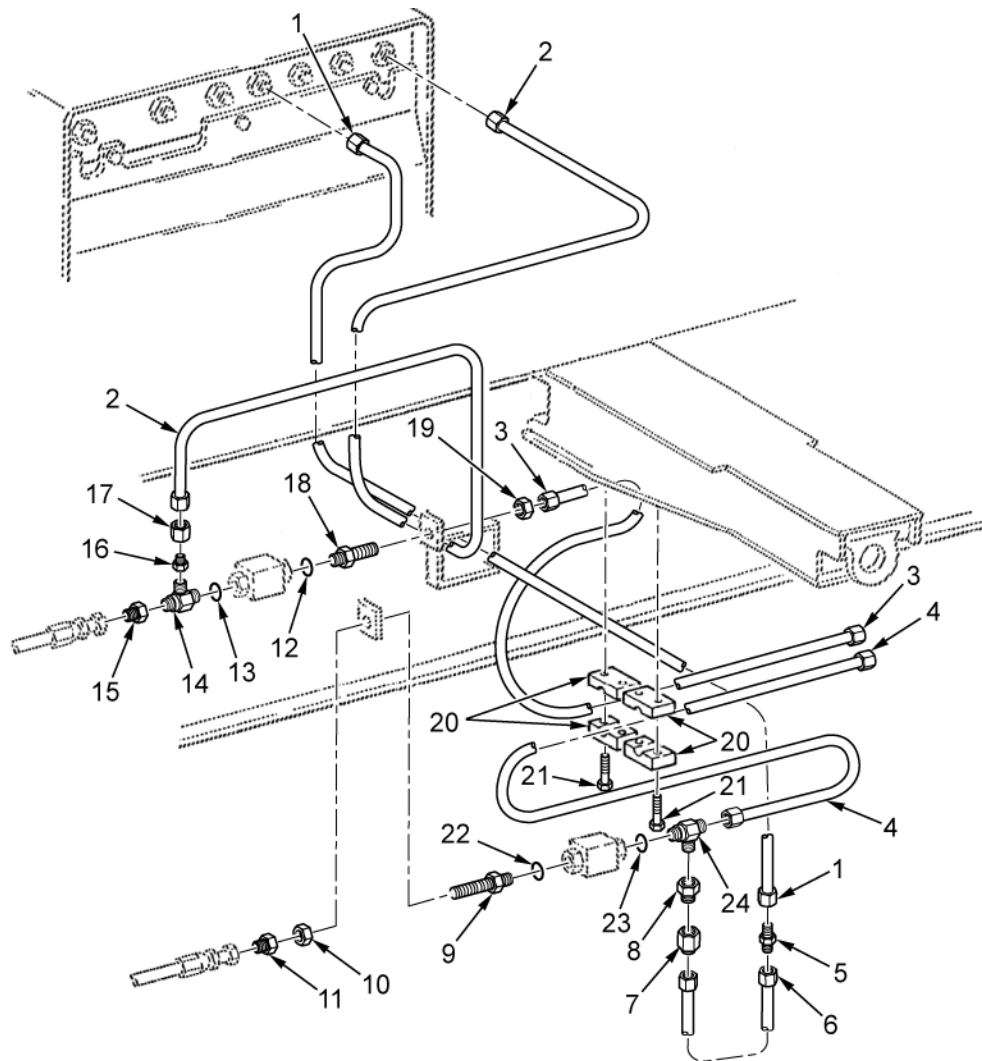


Figure 17. Tubing Installation.

INSTALLATION - Cont.

4. At streetside front, remove caps/plugs. Apply petroleum jelly to two preformed packings (Figure 18, Item 12 and Item 13). Apply pipe sealant to all male threads.
5. Install preformed packing (Figure 18, Item 12), tube nipple (Figure 18, Item 18), and nut (Figure 18, Item 19).
6. Install preformed packing (Figure 18, Item 13), tee (Figure 18, Item 14), reducer (Figure 18, Item 15), reducer (Figure 18, Item 16), coupling nut (Figure 18, Item 17), and tube (Figure 18, Item 2).
7. Remove caps/plugs. Apply petroleum jelly to two preformed packings (Figure 18, Item 22, and Item 23). Apply pipe sealant to all male threads. Install preformed packing (Figure 18 item 22), tube nipple (Figure 18 item 9), nut (Figure 18, Item 10), and reducer (Figure 18, Item 11).
8. Install preformed packing (Figure 18, Item 23), tee (Figure 18, Item 24), reducer (Figure 18 Item 8), coupling nut (Figure 18, Item 7), tube (Figure 18, Item 6), and tube nipple (Figure 18, Item 5). Install four tubes (Figure 18, Item 1, Item 2, Item 3, and Item 4).
9. Install two block clamps (Figure 18, Item 20) and secure with four screws (Figure 18, Item 21).

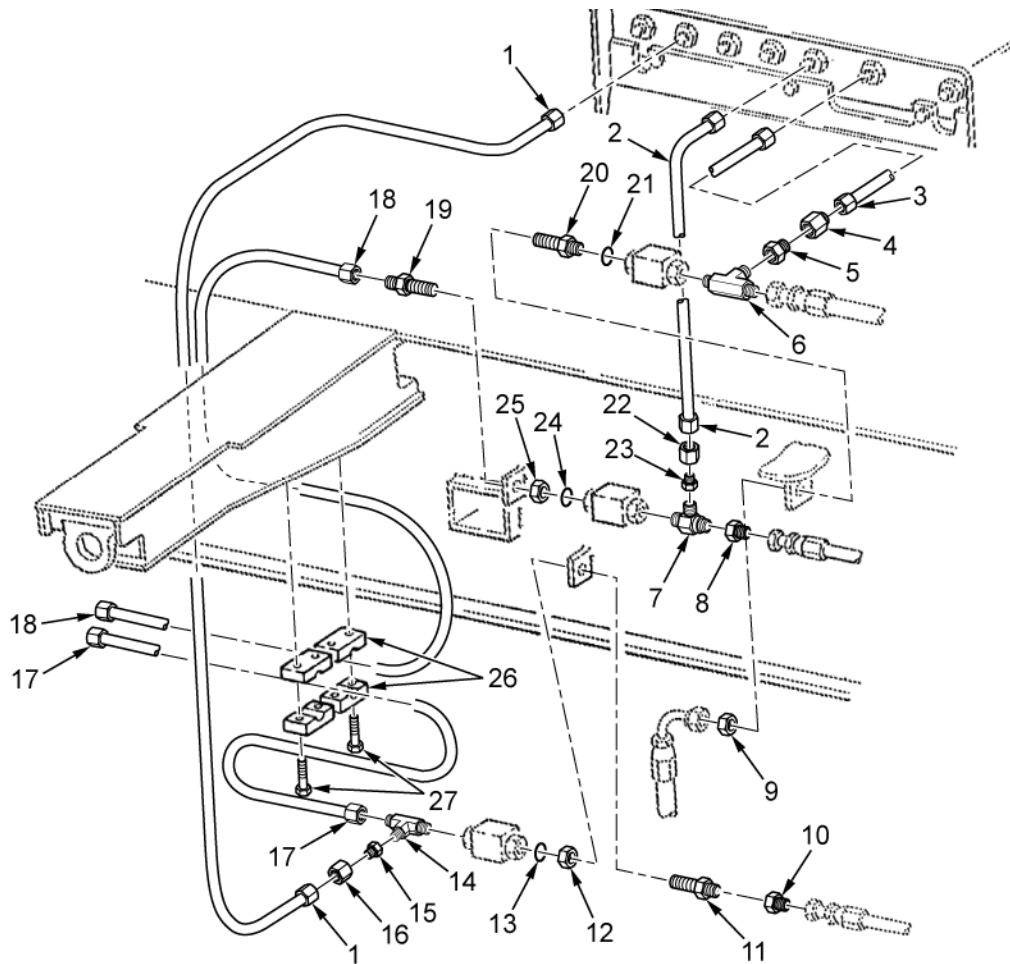


HETT0531

Figure 18. Streetside Tubing Installation.

INSTALLATION - Cont.

10. At curbside front, remove caps/plugs. Apply pipe sealant to all male threads. Install tee (Figure 19, Item 6), reducer (Figure 19, Item 5), coupling nut (Figure 19, Item 4), and tube (Figure 19, Item 3).
11. Remove caps/plugs. Apply petroleum jelly to preformed packing (Figure 19, Item 21). Apply pipe sealant to all male threads. Install preformed packing (Figure 19, Item 21), tube nipple (Figure 19, Item 20), and nut (Figure 19, Item 9).
12. Remove caps/plugs. Apply petroleum jelly to preformed packing (Figure 19, Item 24). Apply pipe sealant to all male threads. Install tube nipple (Figure 19, Item 19), preformed packing (Figure 19, Item 24), nut (Figure 19, Item 25), tee (Figure 19, Item 7), reducer (Figure 19, Item 8), reducer (Figure 19, Item 23), coupling nut (Figure 19, Item 22), and tube (Figure 19, Item 2).
13. Remove caps/plugs. Apply petroleum jelly to preformed packing (Figure 19, Item 13). Apply pipe sealant to all male threads. Install preformed packing (Figure 19, Item 13), nut (Figure 19, Item 12), tube nipple (Figure 19, Item 11), and reducer (Figure 19, Item 10).
14. Remove caps/plugs. Apply pipe sealant to all male threads. Install tee (Figure 19, Item 14), reducer (Figure 19, Item 15), coupling nut (Figure 19, Item 16), and three tubes (Figure 19, Item 1, Item 17, and Item 18).
15. Install two block clamps (Figure 19, Item 26) and secure with four screws (Figure 19, Item 27).

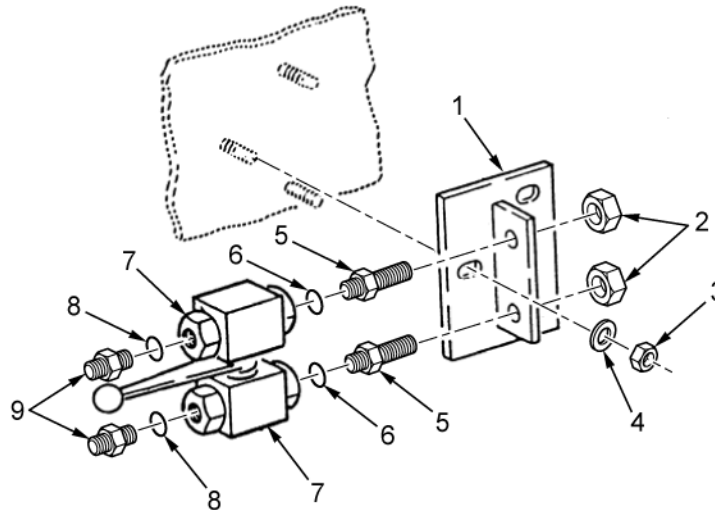


HETT0530

Figure 19. Curbside Tubing Installation.

INSTALLATION - Cont.

16. Remove caps/plugs. Apply petroleum jelly to two preformed packings (Figure 20, Item 6) and two preformed packings (Figure 20, Item 8). Apply pipe sealant to all male threads. Just aft of each bogie, curbside and streetside, install T-bracket (Figure 20, Item 1) and secure with three washers (Figure 20, Item 4) and self-locking nuts (Figure 20, Item 3). Install suspension isolation valve assembly (Figure 20, Item 7), two preformed packings (Figure 20, Item 6), nipples (Figure 20, Item 5), and nuts (Figure 20, Item 2). Install two preformed packings (Figure 20, Item 8) and straight adapters (Figure 20, Item 9).

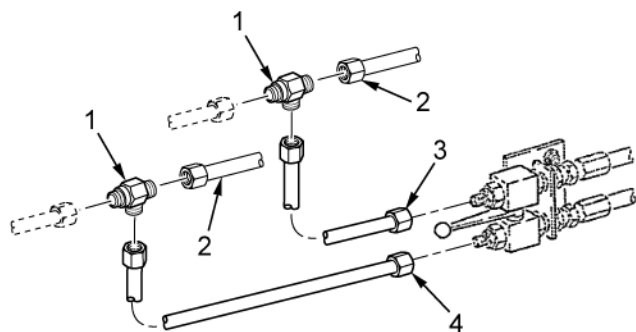
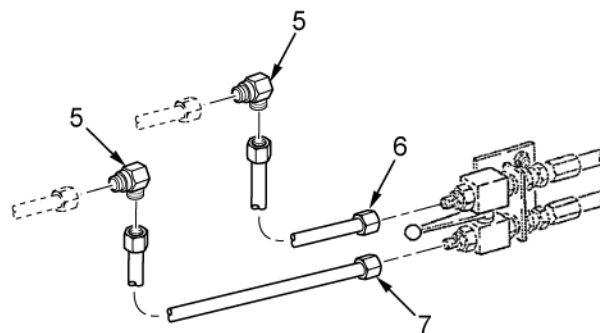
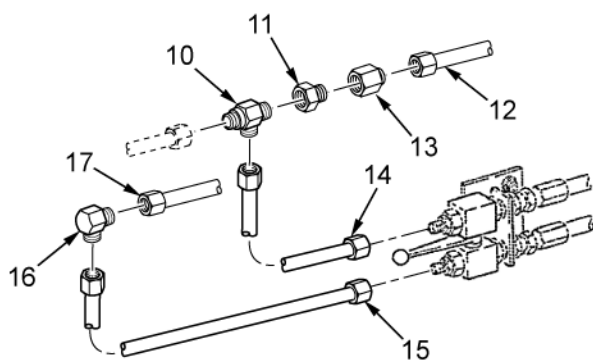
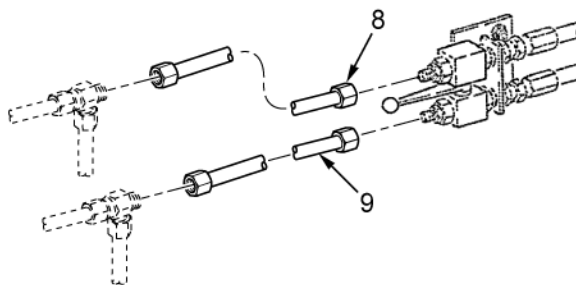


HETT0529

Figure 20. Suspension Isolation Valve Assembly Installation.

17. At streetside bogie No. 5, remove caps/plugs. Install two tubes (Figure 21, Item 8 and Item 9).
18. At streetside bogie No. 4, remove caps/plugs. Apply pipe sealant to all male threads. Install tee (Figure 21, Item 10), reducer (Figure 21, Item 11), coupling nut (Figure 21, Item 13), tube (Figure 21, Item 12), elbow (Figure 21, Item 16), and three tubes (Figure 21, Item 14, Item 15, and Item 17).
19. At streetside bogie No. 3, remove caps/plugs. Apply pipe sealant to all male threads. Install two elbows (Figure 21, Item 5) and tubes (Figure 21, Item 6 and Item 7).
20. At streetside bogies No. 1 and 2, remove caps/plugs. Apply pipe sealant to all male threads. Install two tube tees (Figure 21, Item 1), tubes (Figure 21, Item 2), and tubes (Figure 2, Item 3 and Item 4).

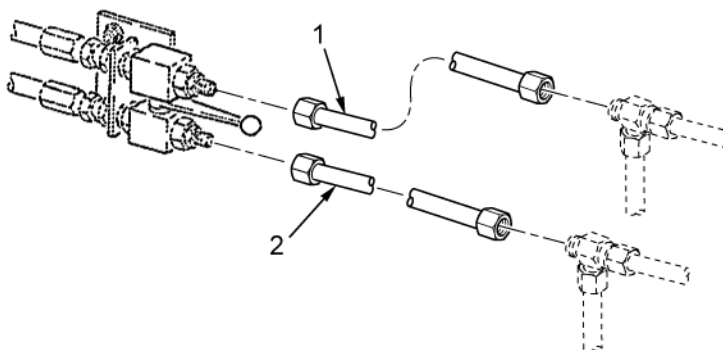
INSTALLATION - Cont.

**STREETSIDE BOGIE NUMBER 1 AND 2****STREETSIDE BOGIE NUMBER 3****STREETSIDE BOGIE NUMBER 4****STREETSIDE BOGIE NUMBER 5**

HETT0528

Figure 21. Streetside Bogies 1 thru 5 Installation.

21. At curbside No. 5 bogie, remove caps/plugs. Install two tubes (Figure 22, Item 2 and Item 1).

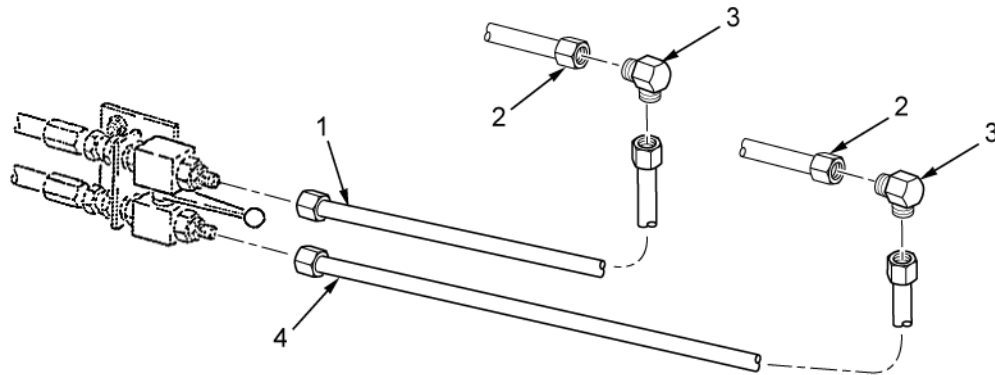


HETT0527

Figure 22. Curbside No. 5 Bogie Installation.

INSTALLATION - Cont.

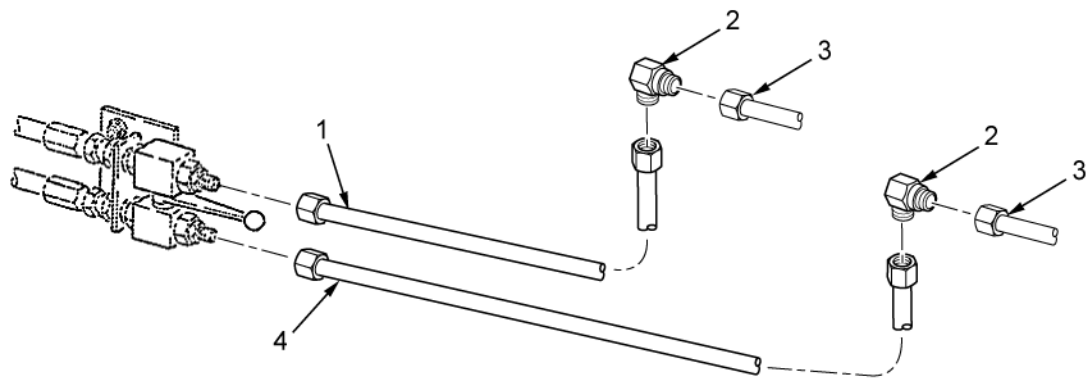
22. At curbside No. 4 bogie, remove caps/plugs. Apply pipe sealant to all male threads. Install two elbows (Figure 23, Item 3), tubes (Figure 23, Item 2), and tubes (Figure 23, Item 4 and Item 1).



HETT0526

Figure 23. Curbside No. 4 Bogie Installation.

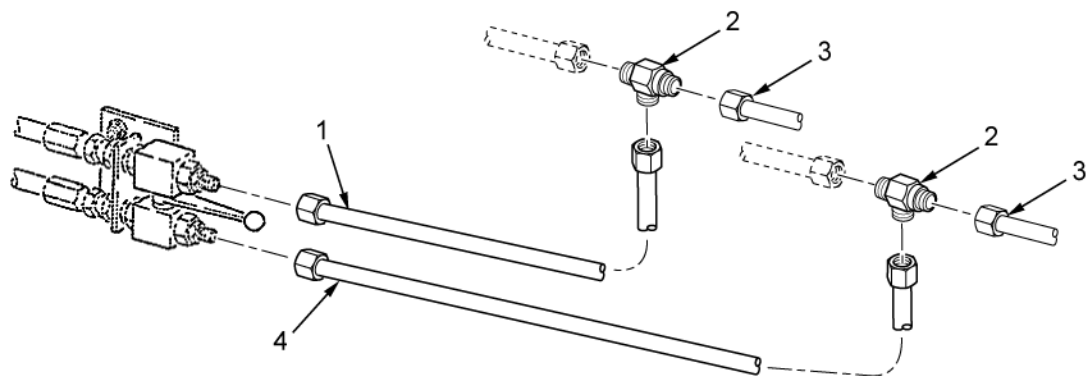
23. At curbside No. 3 bogie, remove caps/plugs. Apply pipe sealant to all male threads. Install two elbows (Figure 24, Item 2), tubes (Figure 24, Item 3), and tubes (Figure 24, Item 4 and Item 1).



HETT0525

Figure 24. Curbside No. 3 Bogie Installation.

24. At curbside No. 2 bogie, remove caps/plugs. Apply pipe sealant to all male threads. Install two tube tees (Figure 25, Item 2), tubes (Figure 25, Item 3), and tubes (Figure 25, Item 4 and Item 1).



HETT0524

Figure 25. Curbside No. 2 Bogie Installation.

INSTALLATION - Cont.

25. At curbside No. 1 bogie, remove caps/plugs. Apply pipe sealant to all male threads. Install two tube tees (Figure 26, Item 2) and tubes (Figure 26, Item 3 and Item 1).

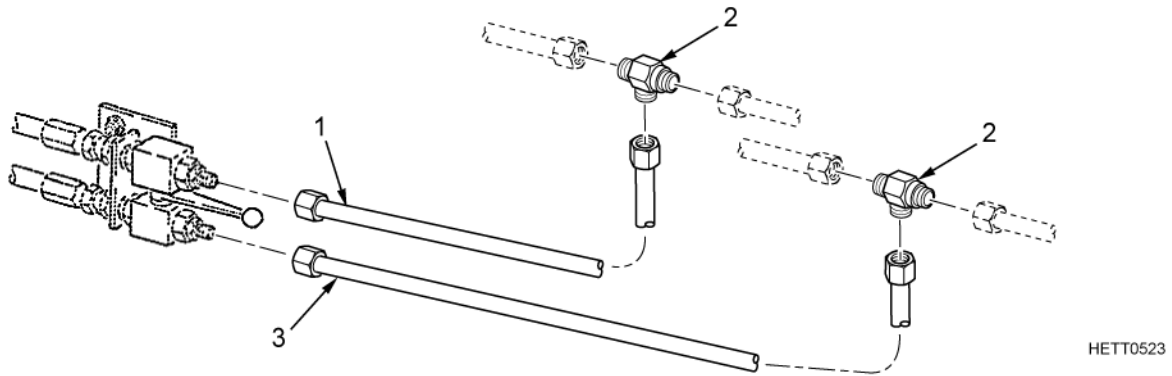
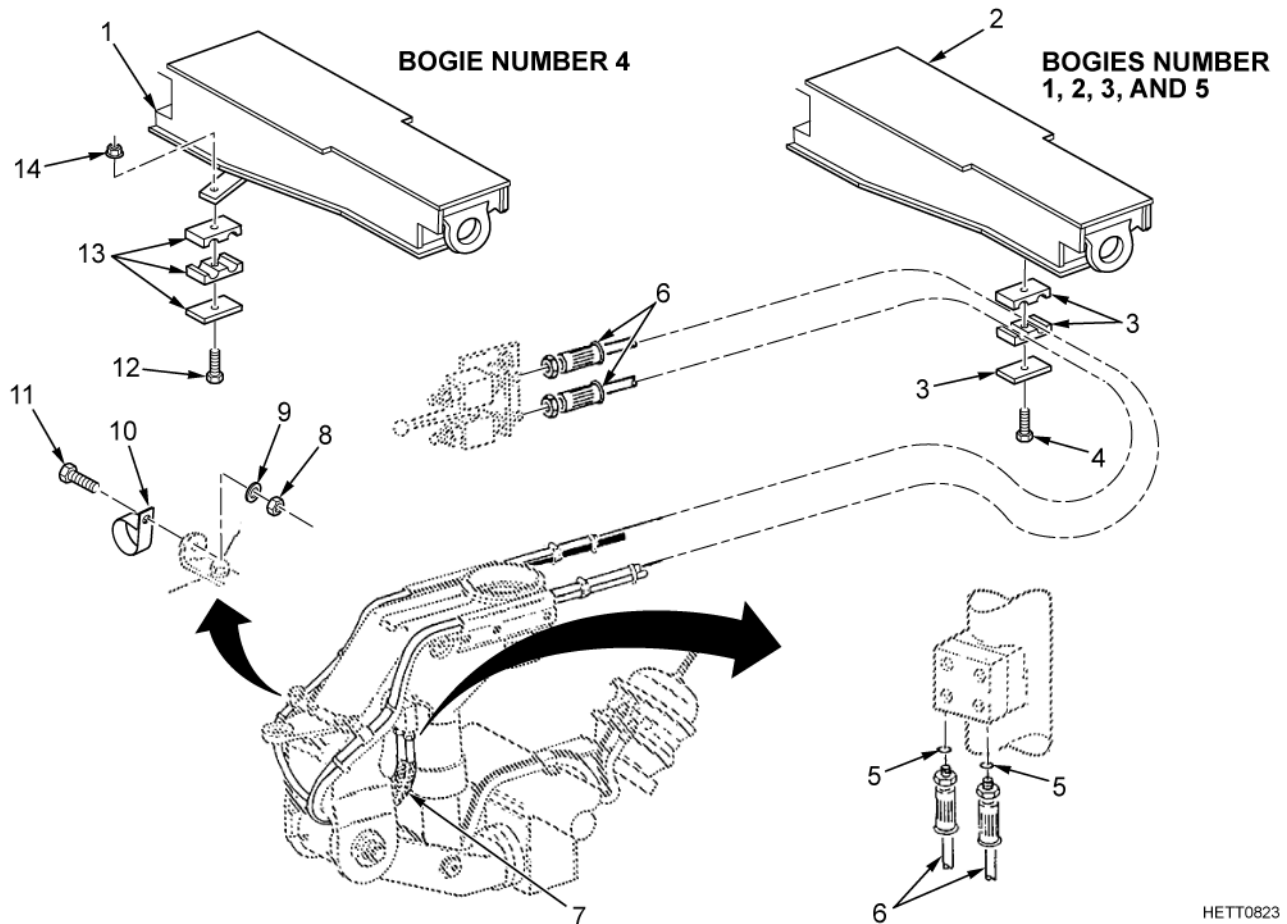


Figure 26. Curbside No. 1 Bogie Installation.

INSTALLATION - Cont.

26. Remove caps/plugs from bogie No. 4 (Figure 27, Item 1). Apply petroleum jelly to two preformed packings (Figure 27, Item 5). Slide loom (Figure 27, Item 7) onto two hoses (Figure 27, Item 6). Install two preformed packings (Figure 27, Item 5) and hoses (Figure 27, Item 6).
27. Install two hose shields (WP 0066).
28. Install two clamps (Figure 27, Item 10) and secure with two screws (Figure 27, Item 11), washers (Figure 27, Item 9), and self-locking nuts (Figure 27, Item 8). Install tiedown straps as required.
29. Install block clamp (Figure 27, Item 13) and secure with screw (Figure 27, Item 12) and nut (Figure 27, Item 14).
30. Remove caps/plugs from bogies Nos. 1, 2, 3, and 5 (Figure 27, Item 2) curbside and streetside. Apply petroleum jelly to two preformed packings (Figure 27, Item 5). Slide loom (Figure 27, Item 7) onto two hoses (Figure 27, Item 6). Install two preformed packings (Figure 27, Item 5) and hoses (Figure 27, Item 6).
31. Install two hose shields (WP 0066).
32. Install two clamps (Figure 27, Item 10) and secure with two screws (Figure 27, Item 11), washers (Figure 27, Item 9), and self-locking nuts (Figure 27, Item 8). Install tiedown straps as required.
33. Install block clamp (Figure 27, Item 3) and secure with screw (Figure 27, Item 4).



HETT0823

Figure 27. Bogies Nos. 1, 2, 3, 4, and 5 Installation.

INSTALLATION - Cont.

34. At ten places streetside (Figure 28, Item B), install block clamp (Figure 29, Item 2) and secure with screw (Figure 29, Item 1).

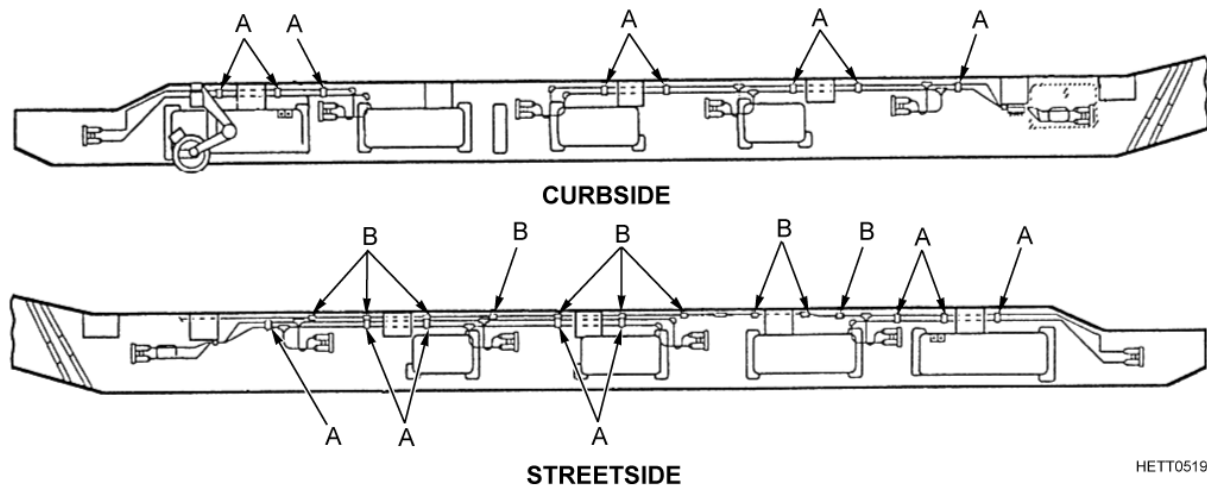


Figure 28. Hydraulic Hose Routing.

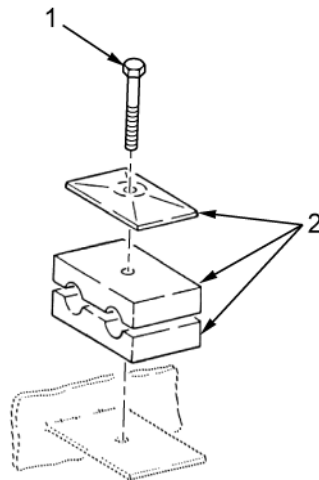


Figure 29. Block Clamp B.

INSTALLATION - Cont.

35. At 16 places (Figure 30, Item A), eight curbside and eight streetside, install block clamp (Figure 31, Item 1) and secure with screw (Figure 31, Item 2).

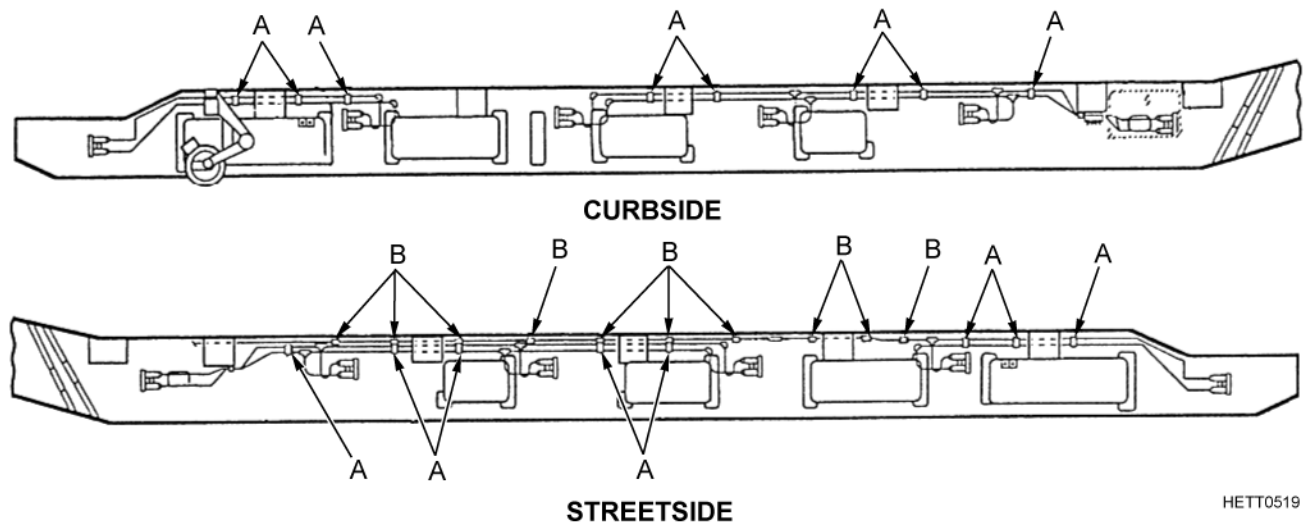


Figure 30. Hydraulic Hose Routing.

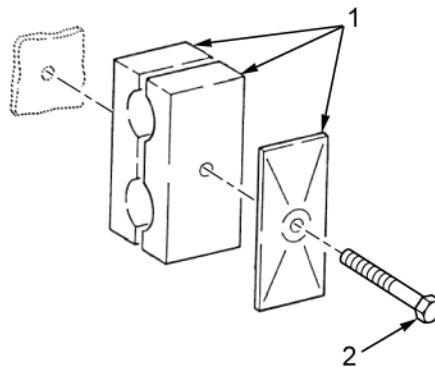


Figure 31. Block Clamp A.

END OF TASK**FOLLOW-ON MAINTENANCE**

- Refill hydraulic tank as required (WP 0039).
- Perform hydraulic system bleeding as required (WP 0041).
- Adjust platform and check for proper operation (WP 0008).

END OF WORK PACKAGE

FIELD MAINTENANCE
PLATFORM STEERING HYDRAULICS

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)

Personnel Required

1

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)

Petroleum Jelly (WP 0170, Item 21)

Pipe Sealant (WP 0170, Item 22)

Rag Wiping, Cotton, and Cotton Synthetic (WP 0170, Item 23)

Solvent, Dry Cleaning (WP 0170, Item 32)

Preformed Packing (4) (TM9-2330-381-24P)

Equipment Conditions

Front and rear support legs lowered supporting platform, operating front support legs (WP 0011), operating rear support legs (WP 0012)

Steering system hydraulic bled to relieve pressure (WP 0041)

GENERAL INFORMATION

This work package provides instructions for the removal, repair, and installation of the platform steering hydraulics.

REMOVAL**WARNING**

- Hydraulic fluid may be hot if system has been in operation. Allow time to cool before performing maintenance, or injury to personnel may result.
- Residual pressure may remain in hydraulic lines. Open fittings slowly or injury to personnel may result.
- Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into eyes, flush immediately with water and seek medical attention. If hydraulic fluid gets on skin, wash thoroughly with soap and water. Wash hands thoroughly prior to eating or smoking.

Failure to follow these warnings may result in injury or death to personnel.

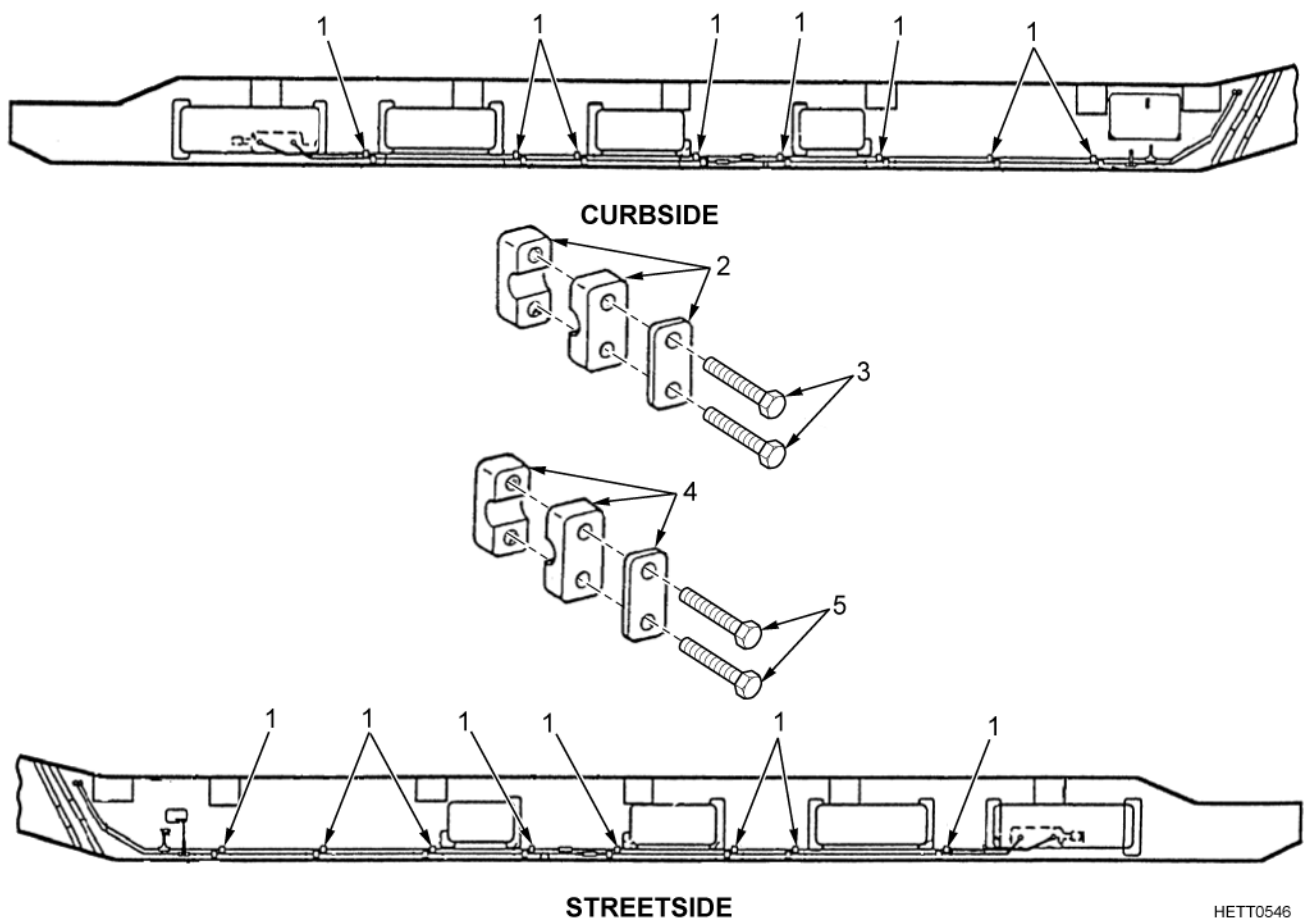
CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or foreign material from entering the hydraulic system, or damage to equipment may result.

NOTE

This procedure is for removal/installation of all platform steering hydraulics components. Perform this procedure, or any portion of this procedure, as required to complete the necessary repair. Use the hydraulic schematic (Figure 1) as a guide for hose routing.

1. At 16 places (Figure 1, Item 1), eight curbside and eight streetside, remove two screws (Figure 1, Item 3), block clamp (Figure 1, Item 2), two screws (Figure 1, Item 5), and block clamp (Figure 1, Item 4).



HETT0546

Figure 1. Platform Steering Hydraulics.

2. At streetside front (Figure 2, Item 1), remove three screws (Figure 2, Item 2), block clamps (Figure 2, Item 3), and clamp (Figure 2, Item 4).

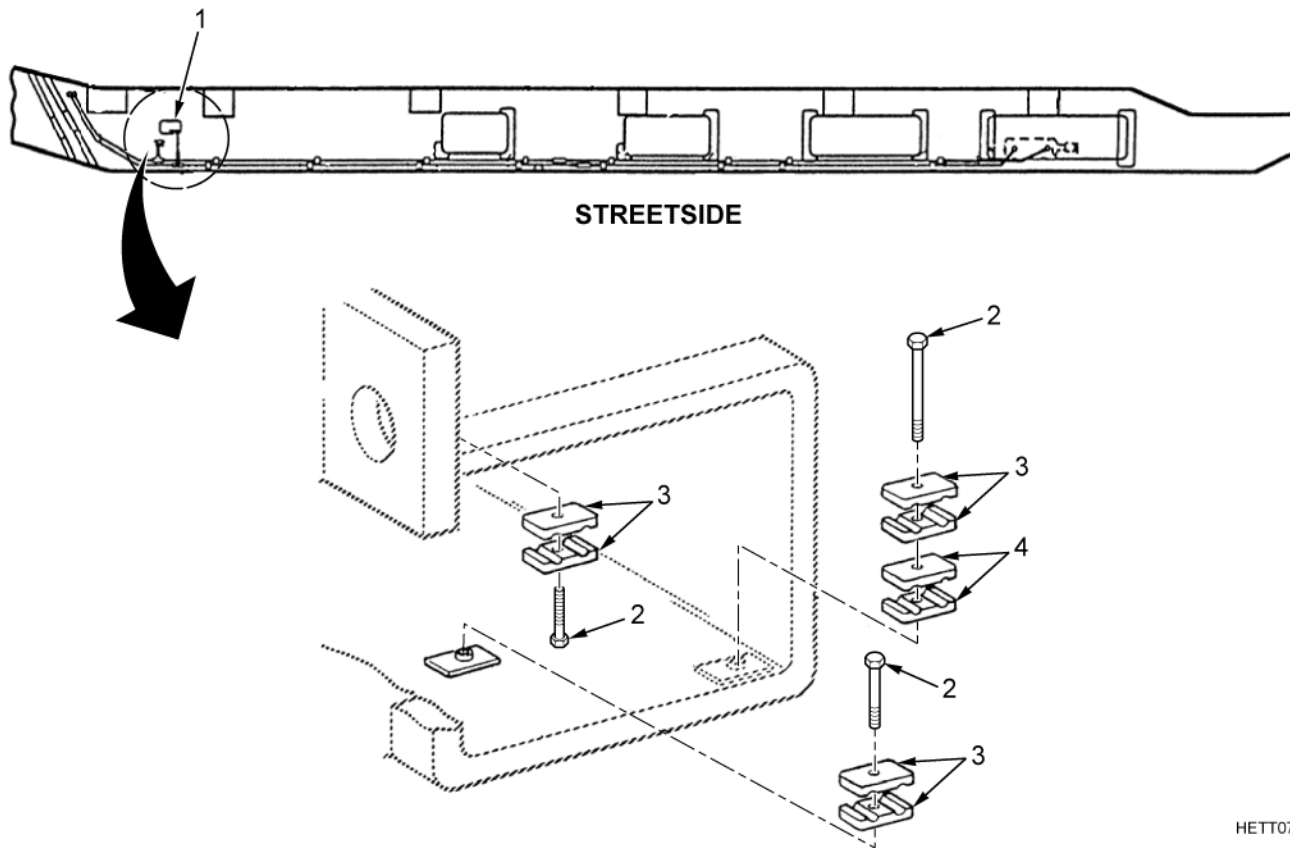


Figure 2. Platform Steering Hydraulics.

3. At curbside rear and streetside rear (Figure 3, Item 1), tag and remove hose (Figure 3, Item 3), boss coupling (Figure 3, Item 2), hose (Figure 3, Item 5), tube nipple (Figure 3, Item 4), two tube elbows (Figure 3, Item 6), two preformed packings (Figure 3, Item 7), and pipe plug (Figure 3, Item 8). Install caps/plugs in all openings (Figure 3, Item 9). Discard preformed packings.

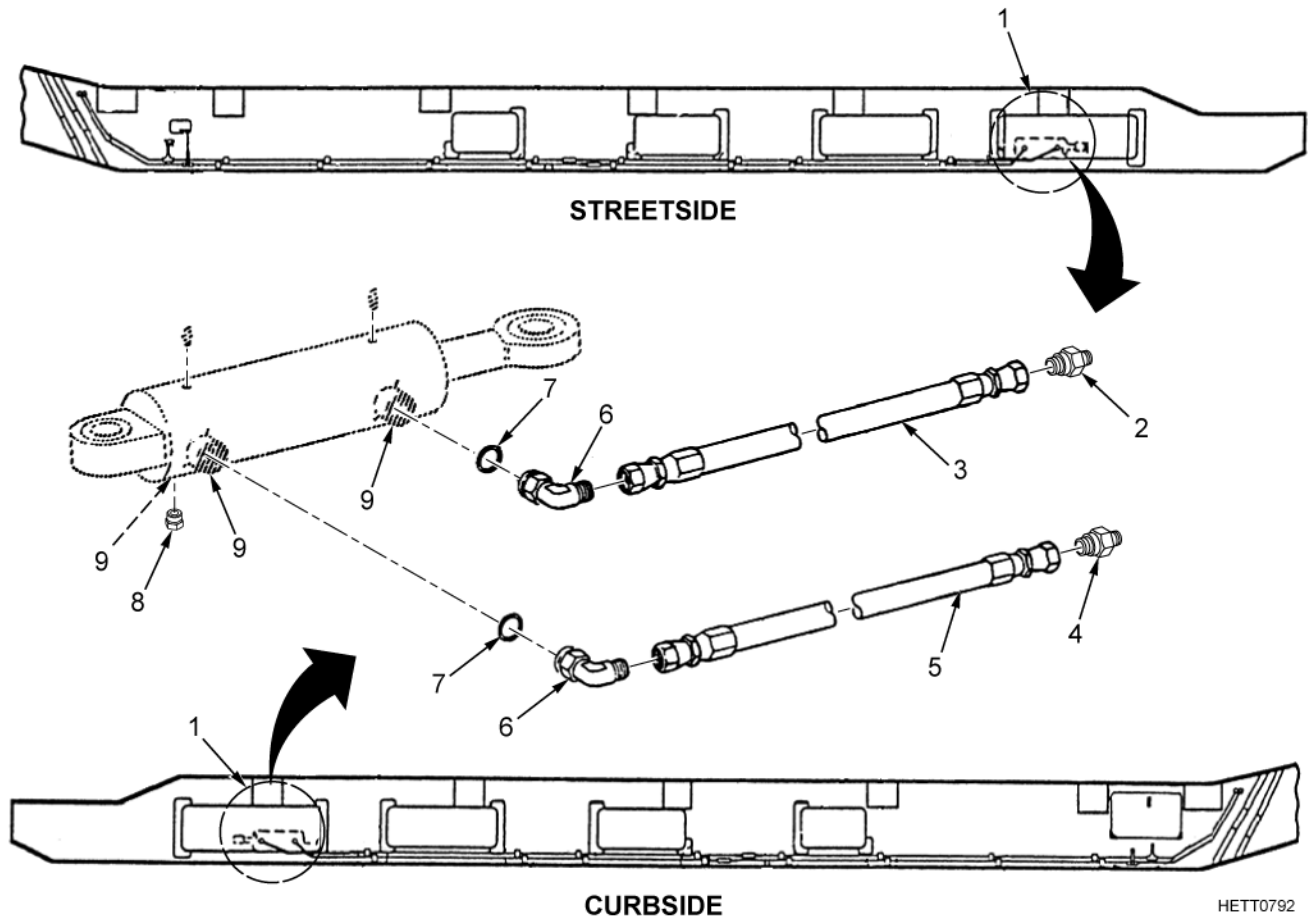


Figure 3. Platform Steering Hydraulics.

4. At curbside and streetside (Figure 4, Item 1), tag and remove tube (Figure 4, Item 6), boss coupling (Figure 4, Item 7), tube (Figure 4, Item 8), tube (Figure 4, Item 5), tube nipple (Figure 4, Item 4), and tube (Figure 4, Item 3). Install caps/plugs in all openings (Figure 4, Item 2).

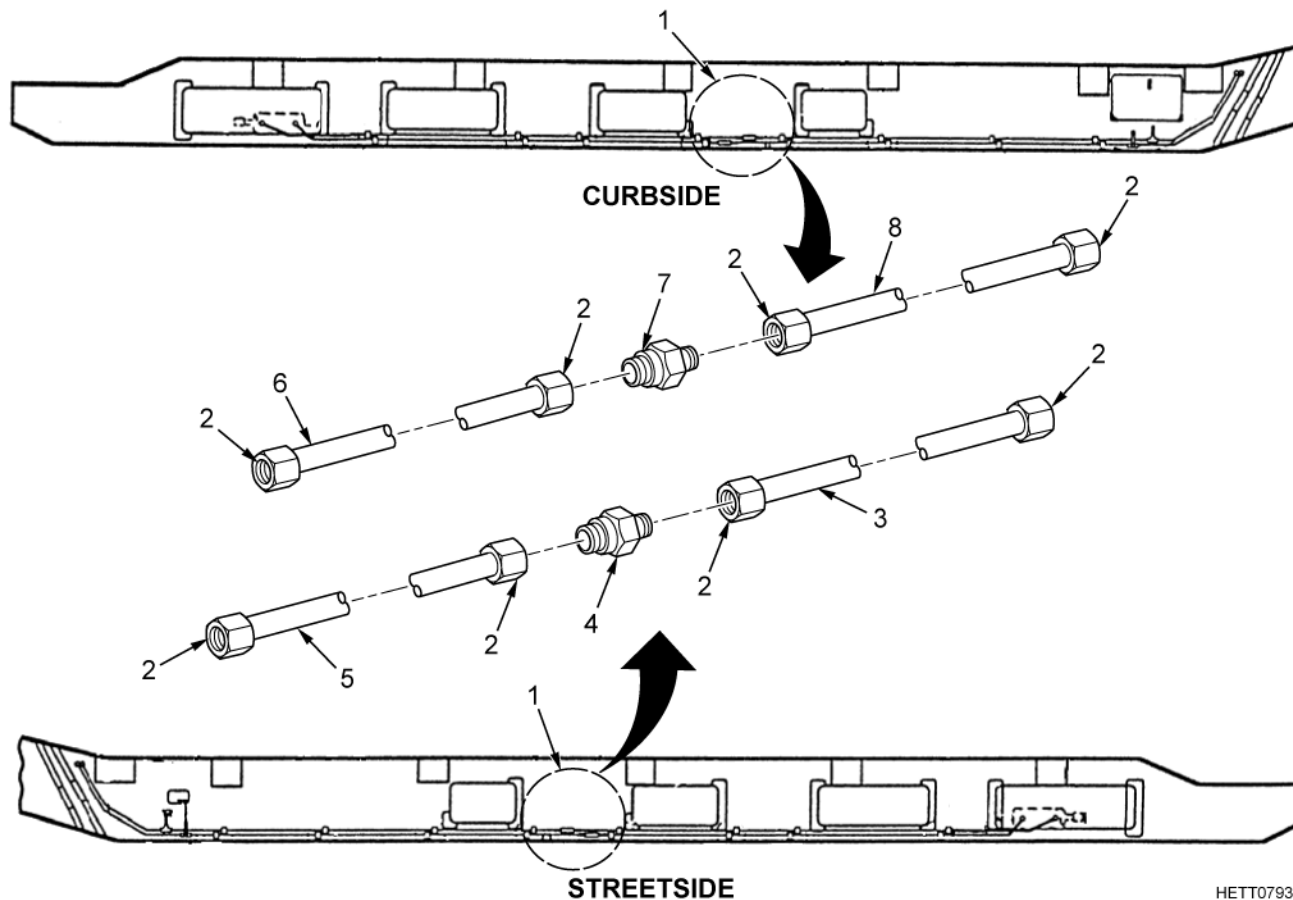


Figure 4. Platform Steering Hydraulics.

5. At curbside front (Figure 5, Item 1), tag and remove tube (Figure 5, Item 2), coupling nut (Figure 5, Item 10), reducer (Figure 5, Item 9), and tube tee (Figure 5, Item 8). Remove tube (Figure 5, Item 3), coupling nut (Figure 5, Item 5), reducer (Figure 5, Item 6), and tube tee (Figure 5, Item 7). Install caps/plugs (Figure 5, Item 4) in all openings (Figure 5, Item 4).

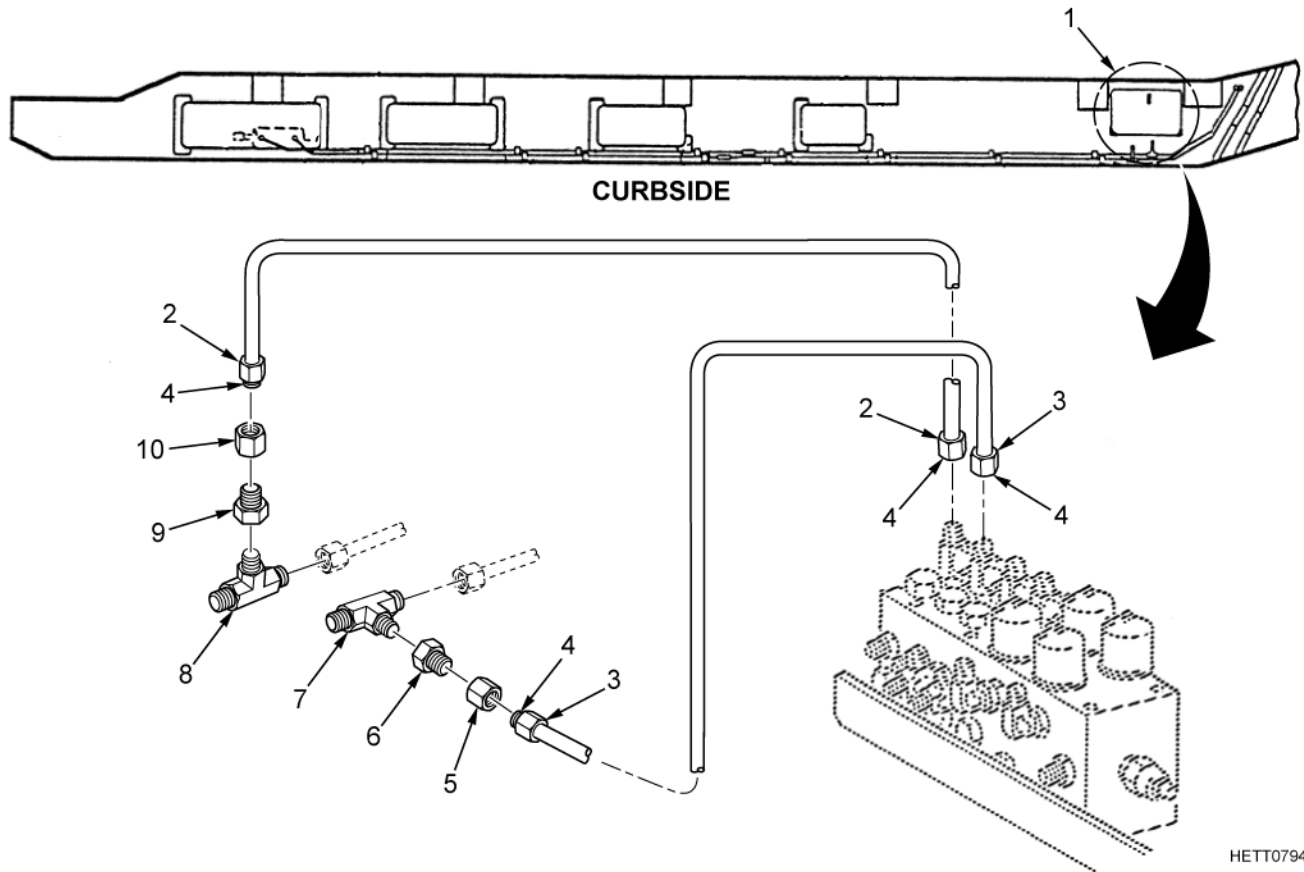
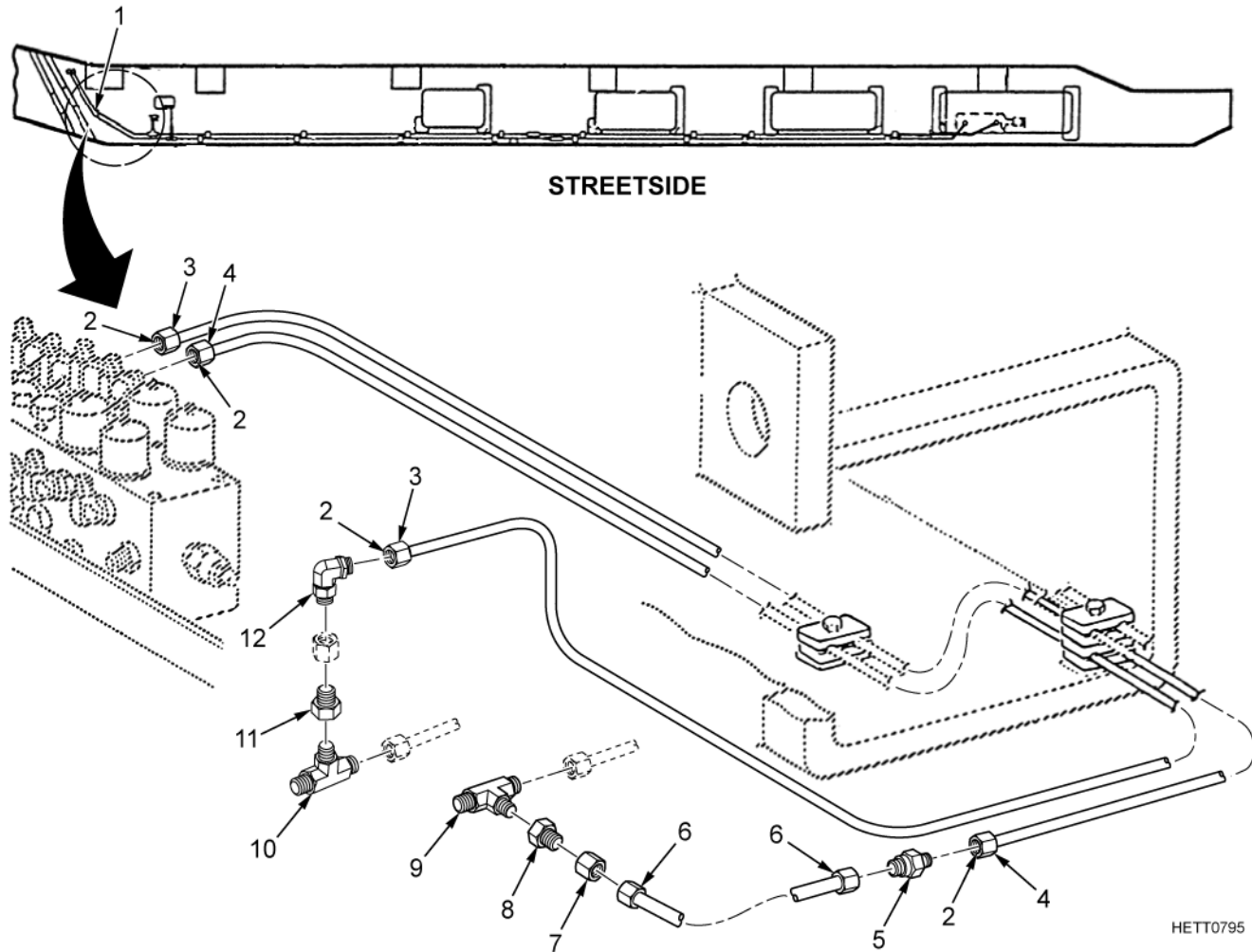


Figure 5. Platform Steering Hydraulics.

6. At streetside front (Figure 6, Item 1), tag and remove tube (Figure 6, Item 3), tube elbow (Figure 6, Item 12), reducer (Figure 6, Item 11), and tube tee (Figure 6, Item 10). Remove tube (Figure 6, Item 4), tube nipple (Figure 6, Item 5), tube (Figure 6, Item 6), coupling nut (Figure 6, Item 7), reducer (Figure 6, Item 8), and tube tee (Figure 6, Item 9). Install caps/plugs in all openings (Figure 6, Item 2).

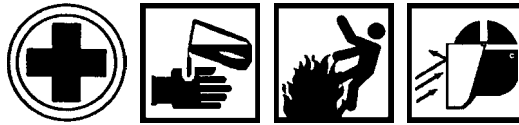


HETT0795

Figure 6. Platform Steering Hydraulics.

END OF TASK

REPAIR

WARNING**SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
- The flashpoint for Type II solvent cleaning compound is 141° to 198°F (61° to 92°C) and for Type III it is 200° to 241°F (93° to 116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound.
- Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.
- Compressed air used for cleaning/drying can create airborne particles that may injure the eyes. Always wear eye protection. Pressure must not exceed 30 psi (207 kPa) or injury to personnel may result.

Failure to follow these warnings may result in injury or death to personnel.

1. Clean inside of hoses with compressed air. Clean outside of hoses with wiping rags. Clean all other components with dry cleaning solvent.
2. Inspect hoses for kinks, splits, deterioration, chafing, cuts, and loose fittings. If hose is defective, replace hose.
3. Inspect tubes for kinks, deterioration, chafing, gouges, and loose fittings. If tube is damaged, replace tube.
4. Inspect other components for nicks, burrs, corrosion, stripped threads, broken castings, and pitting. If parts are defective, replace as required.

END OF TASK

INSTALLATION

CAUTION

- Apply pipe sealant compound to all male pipe threads of hydraulic fitting, using only enough compound to coat the threads. **DO NOT** allow the compound to enter a component/fitting or the compound may restrict fluid passages and damage to equipment or equipment failure may result.
 - Note positioning/orientation of fittings on the illustrations. It is important to have the tightened fitting positioned as shown so that hoses are not too short and fittings **DO NOT** interfere with one another, or damage to equipment may result.
1. At streetside front (Figure 7, Item 1), remove caps/plugs from openings (Figure 7, Item 2). Apply pipe sealant to all male threads. Install tube tee (Figure 7, Item 9), reducer (Figure 7, Item 8), coupling nut (Figure 7, Item 7), tube (Figure 7, Item 6), tube nipple (Figure 7, Item 5), and tube (Figure 7, Item 4). Install tube tee (Figure 7, Item 10), reducer (Figure 7, Item 11), tube elbow (Figure 7, Item 12), and tube (Figure 7, Item 3).

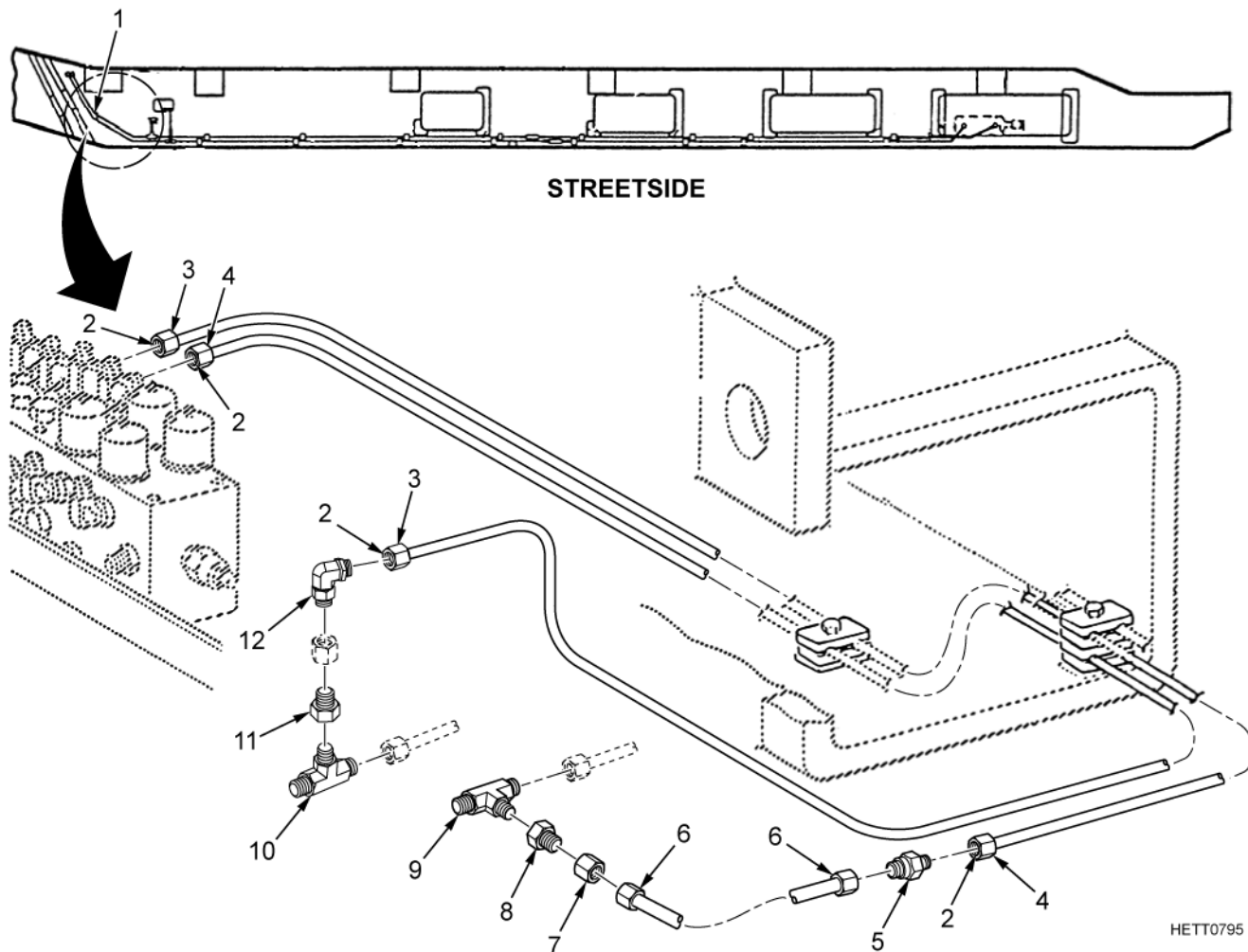
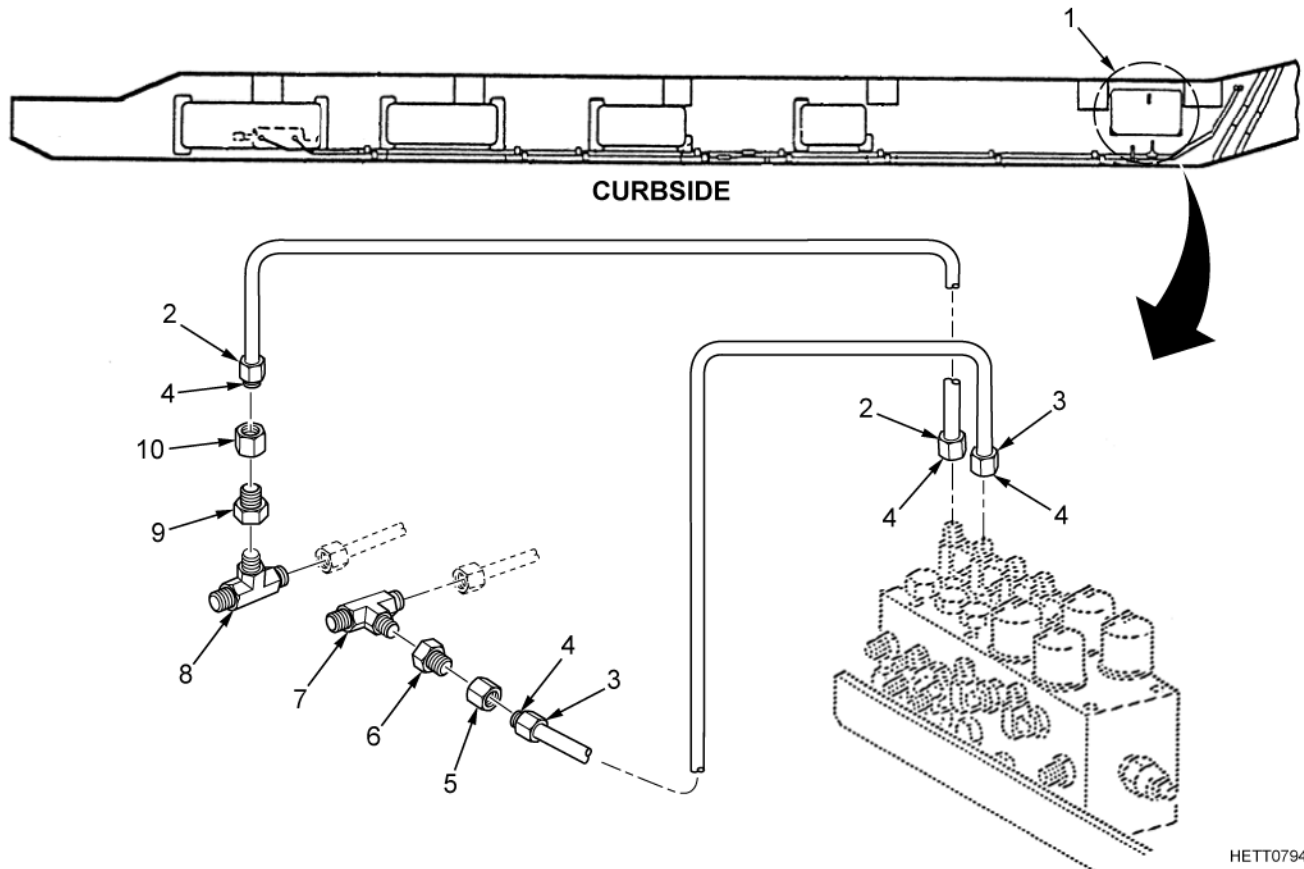


Figure 7. Platform Steering Hydraulics.

2. At curbside front (Figure 8, Item 1), remove caps/plugs from openings (Figure 8, Item 4). Apply pipe sealant to all male threads. Install tube tee (Figure 8, Item 7), reducer (Figure 8, Item 6), coupling nut (Figure 8, Item 5), and tube (Figure 8, Item 3). Install tube tee (Figure 8, Item 8), reducer (Figure 8, Item 9), coupling nut (Figure 8, Item 10), and tube (Figure 8, Item 2).



HETT0794

Figure 8. Platform Steering Hydraulics.

3. At curbside and streetside (Figure 9, Item 1), remove caps/plugs from opening (Figure 9, Item 2). Apply pipe sealant to all male threads. Install tube (Figure 9, Item 6), tube nipple (Figure 9, Item 7), tube (Figure 9, Item 8), tube (Figure 9, Item 5), boss coupling (Figure 9, Item 4), and tube (Figure 9, Item 3).

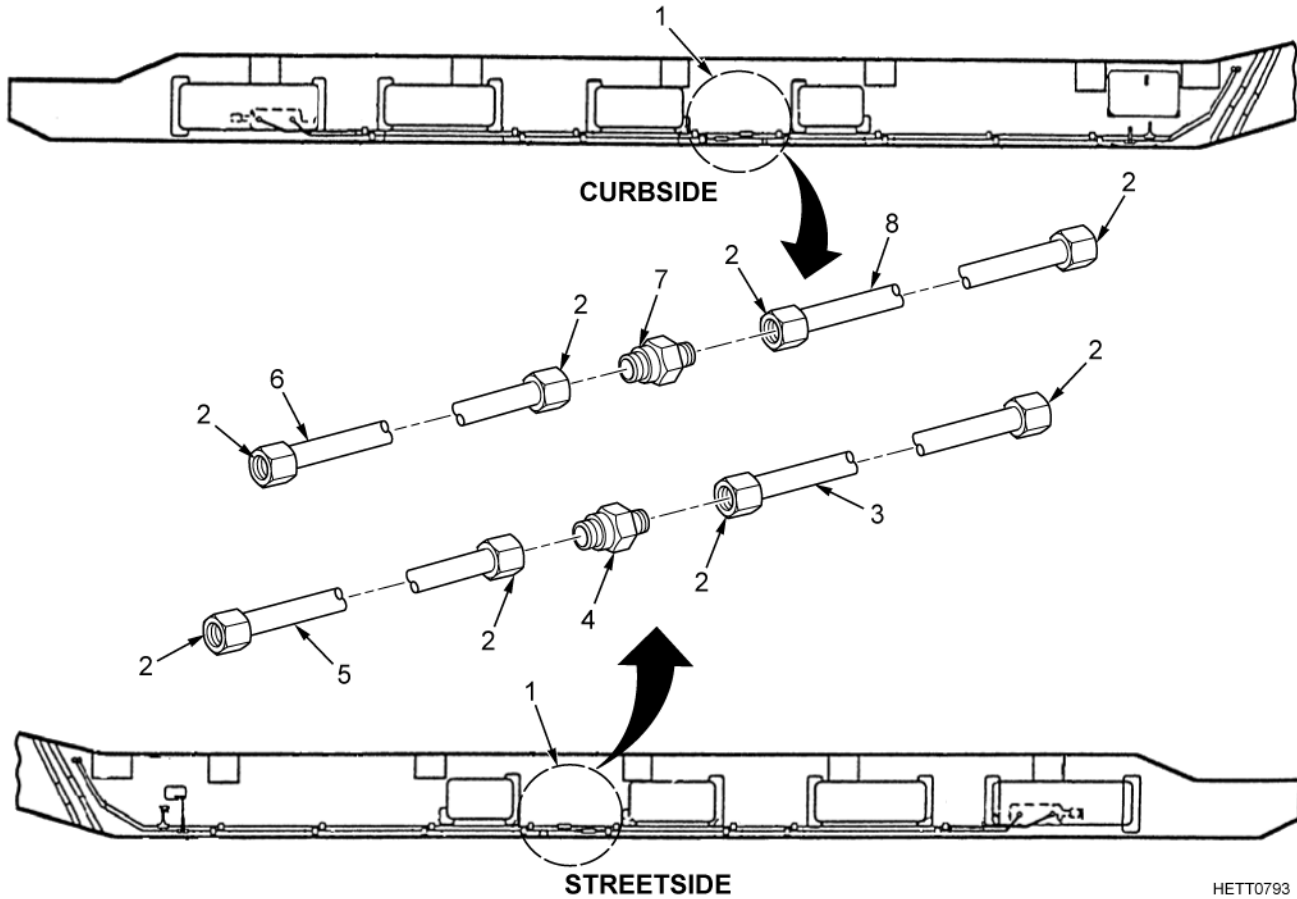


Figure 9. Platform Steering Hydraulics.

4. At curbside and streetside rear (Figure 10, Item 1), remove caps/plugs from opening (Figure 10, Item 9). Apply petroleum jelly to preformed packing (Figure 10, Item 7). Apply pipe sealant to all male threads. Install pipe plug (Figure 10, Item 8), two preformed packings (Figure 10, Item 7), tube elbows (Figure 10, Item 6), tube nipple (Figure 10, Item 4), hose (Figure 10, Item 5), boss coupling (Figure 10, Item 2), and hose (Figure 10, Item 3).

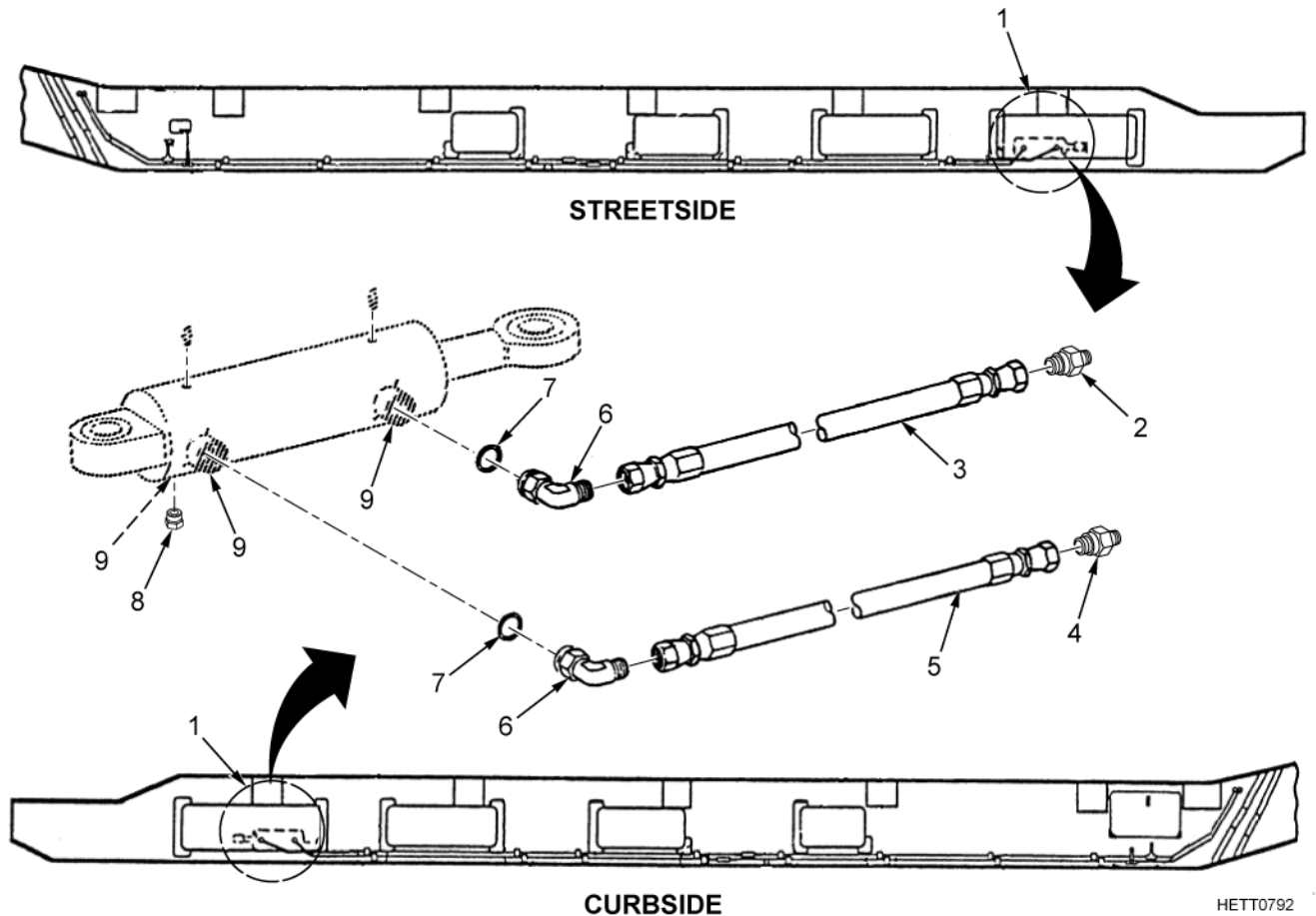
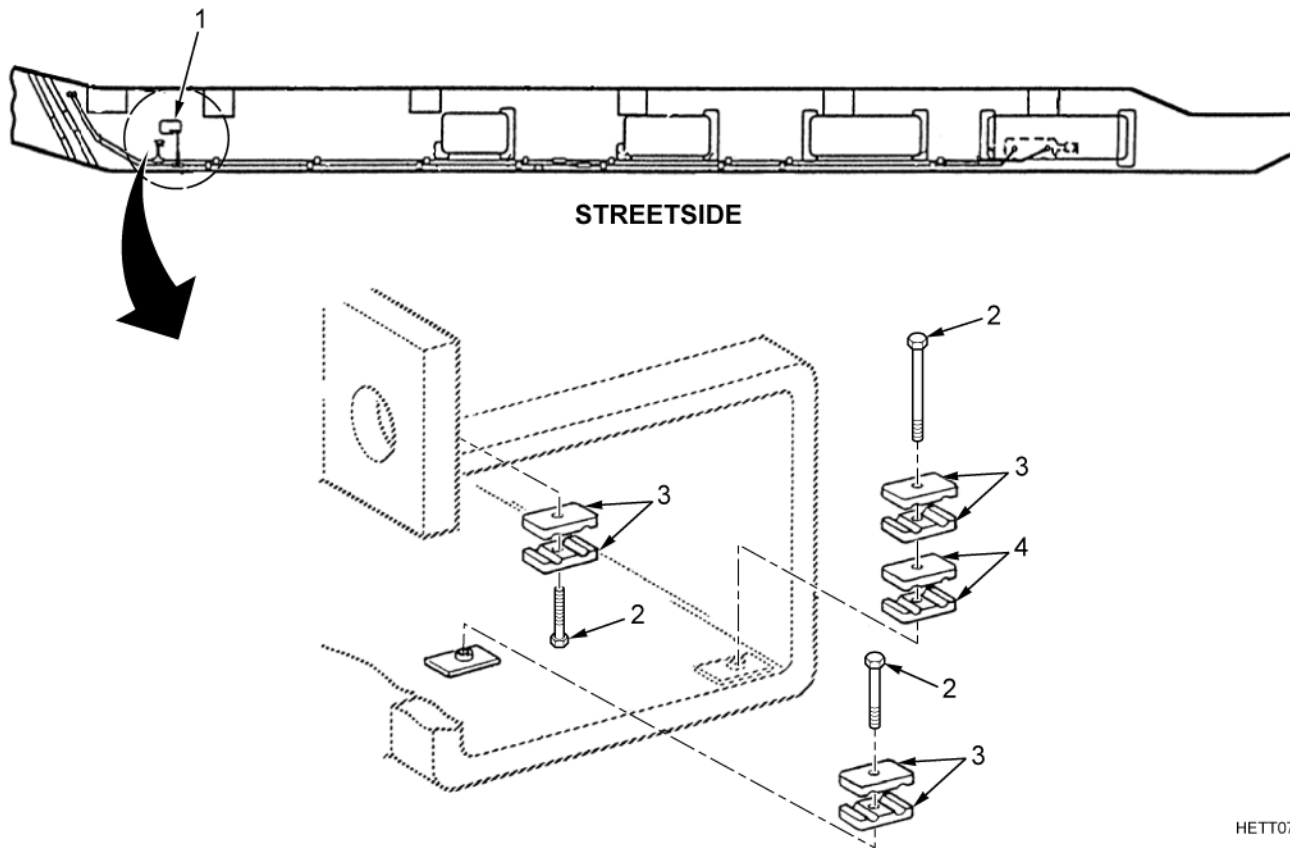


Figure 10. Platform Steering Hydraulics.

5. At streetside front (Figure 11, Item 1), install clamp (Figure 11, Item 4) and block clamp (Figure 11, Item 3) and secure with screw (Figure 11, Item 2). Install two block clamps (Figure 11, Item 3) and secure with screws (Figure 11, Item 2).



HETT0796

Figure 11. Platform Steering Hydraulics.

6. At 16 places (Figure 11, Item 1), eight curbside and eight streetside, install block clamp (Figure 11, Item 4) and secure with two screws (Figure 11, Item 5). Install block clamp (Figure 11, Item 2) and secure with two screws (Figure 11, Item 3).

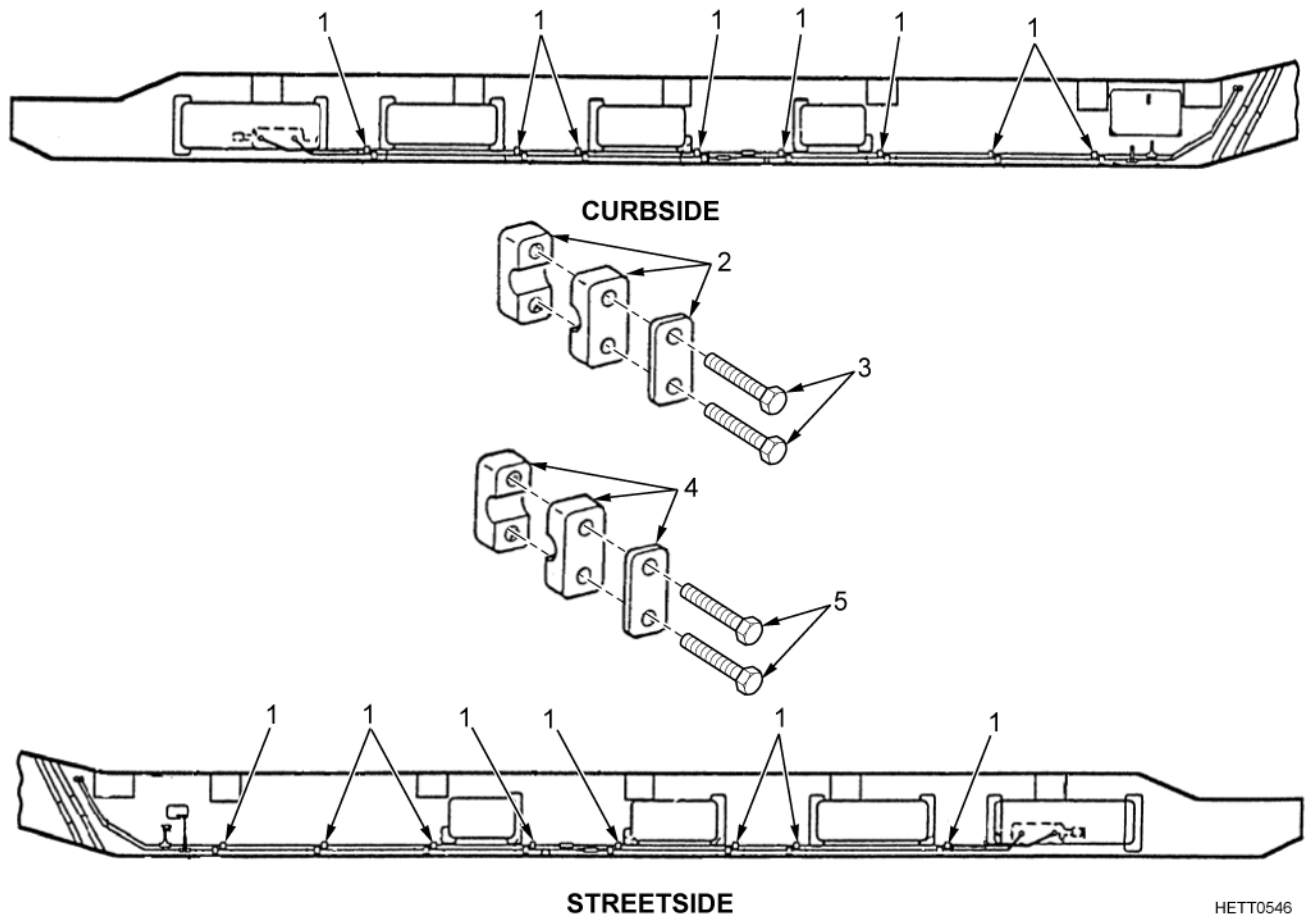


Figure 12. Platform Steering Hydraulics.

END OF TASK

FOLLOW-ON MAINTENANCE

Check/fill hydraulic tank as required (WP 0039).

Perform steering cylinder bleeding as required (WP 0041).

Operate steering system and check for proper operation (WP 0010).

END OF WORK PACKAGE

FIELD MAINTENANCE
HYDRAULIC TANK ASSEMBLY

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (SATS) (WP 0168, Item 28)

Gasket (TM 9-2330-381-24P)

Personnel Required

2

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Petroleum Jelly (WP 0170, Item 21)
Pipe Sealant (WP 0170, Item 22)
Rag, Wiping, Cotton, and Cotton Synthetic (WP 0170, Item 23)
Solvent, Dry Cleaning (WP 0170, Item 32)
Lockwasher (8) (TM 9-2330-381-24P)
Preformed Packing (2) (TM 9-2330-381-24P)

Equipment Conditions

Gooseneck steps removed (WP 0087)
Battery removed (WP 0053)
Auxiliary Power Unit (APU) hydraulic line removed from
hydraulic tank (WP 0117)

GENERAL INFORMATION

This work package provides instructions for the removal, repair, and installation of the hydraulic tank assembly.

REMOVAL**WARNING**

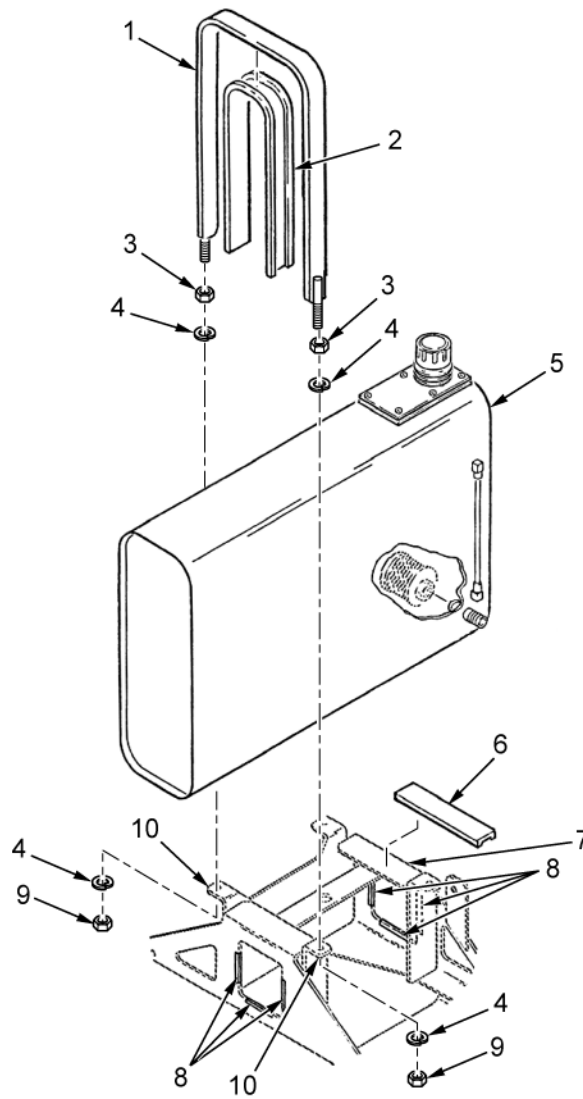
- Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into eyes, flush immediately with water and seek medical attention. If hydraulic fluid gets on skin, wash thoroughly with soap and water. Wash hands thoroughly prior to eating or smoking.
- Hydraulic fluid may be hot if system has been in operation. Allow time to cool before performing maintenance or injury to personnel may result.

Failure to follow these warnings may result in serious injury to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or foreign material from entering the hydraulic system, or damage to equipment may result.

1. From underside of hydraulic tank (Figure 1, Item 5), remove four nuts (Figure 1, Item 9), eight lockwashers (Figure 1, Item 4), four nuts (Figure 1, Item 3), two clamp bolt assemblies (Figure 1, Item 1), and two clamp bolt (protective molding) assemblies (Figure 1, Item 2) from mounting holes (Figure 1, Item 10) on APU frame (Figure 1, Item 7). Discard lockwashers.
2. Slant hydraulic tank (Figure 1, Item 5) forward and remove hydraulic tank from APU frame (Figure 1, Item 7).
3. Remove two retaining (protective molding) straps (Figure 1, Item 6). If necessary, remove six moldings (Figure 1, Item 8) from APU frame (Figure 1, Item 7).



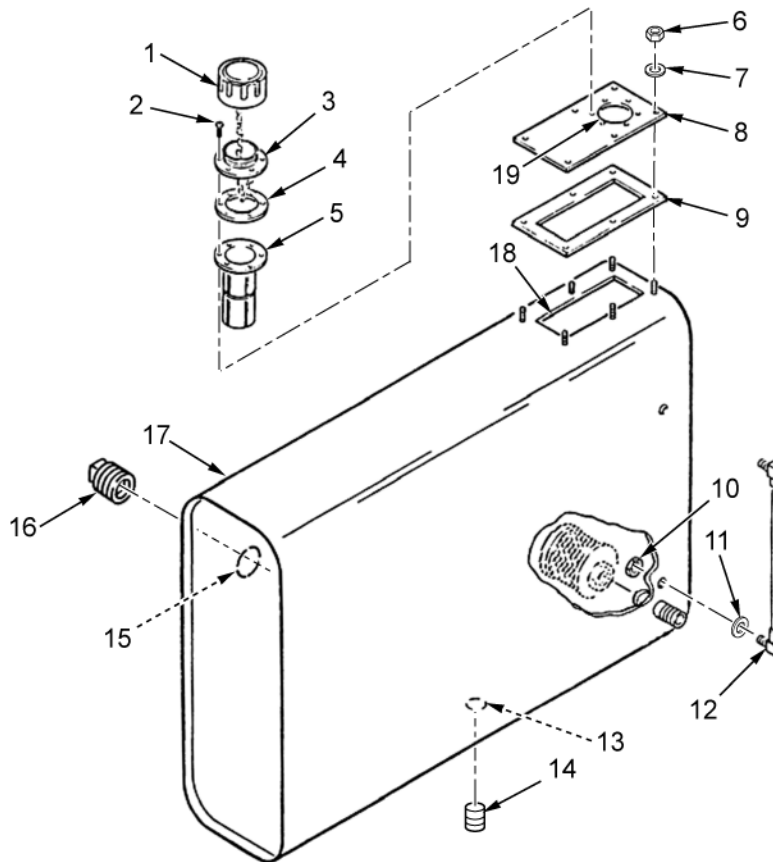
HETT0807

Figure 1. Hydraulic Tank Assembly.

END OF TASK

REPAIR

1. Remove filler cap (Figure 2, Item 1), six screws (Figure 2, Item 2), filler neck (Figure 2, Item 3), gasket (Figure 2, Item 4), and filter (Figure 2, Item 5) from hydraulic tank (Figure 2, Item 17). Cover opening (Figure 2, Item 19) with a wiping rag. Discard gasket if removed.
2. Remove six nuts (Figure 2, Item 6), washers (Figure 2, Item 7), access cover (Figure 2, Item 8), and gasket (Figure 2, Item 9) from hydraulic tank (Figure 2, Item 17). Cover opening (Figure 2, Item 18) with a wiping rag. Discard gasket.
3. Remove two nuts (Figure 2, Item 10), sight indicator (Figure 2, Item 12), and two preformed packings (Figure 2, Item 11). Remove pipe plug (Figure 2, Item 16) from hydraulic tank (Figure 2, Item 17). Install caps/plugs in opening (Figure 2, Item 15). Discard preformed packings.
4. Remove pipe plug (Figure 2, Item 14) from hydraulic tank (Figure 2, Item 17). Install cap/plug in tank opening (Figure 2, Item 13). Unscrew and remove hydraulic tank filter (WP 0123).



HETT0806

Figure 2. Hydraulic Tank Assembly.

WARNING**SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
- The flashpoint for Type II solvent cleaning compound is 141° to 198°F (61° to 92°C) and for Type III it is 200° to 241°F (93° to 116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound.
- Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.
- Compressed air used for cleaning/drying may create airborne particles that may injure the eyes. Always wear eye protection. Pressure must not exceed 30 psi (207 kPa) or injury to personnel may result.

Failure to follow these warnings may result in injury or death to personnel.

5. Clean hydraulic tank and all other components with dry cleaning solvent, wiping rags, and compressed air.
6. Inspect all components for nicks, burrs, corrosion, stripped threads, broken castings, and pitting. Clean all polished surfaces using crocus cloth. If parts are defective, replace as required.
7. Inspect magnetic pipe plug for metal particles, which may indicate impending failure in hydraulic system.

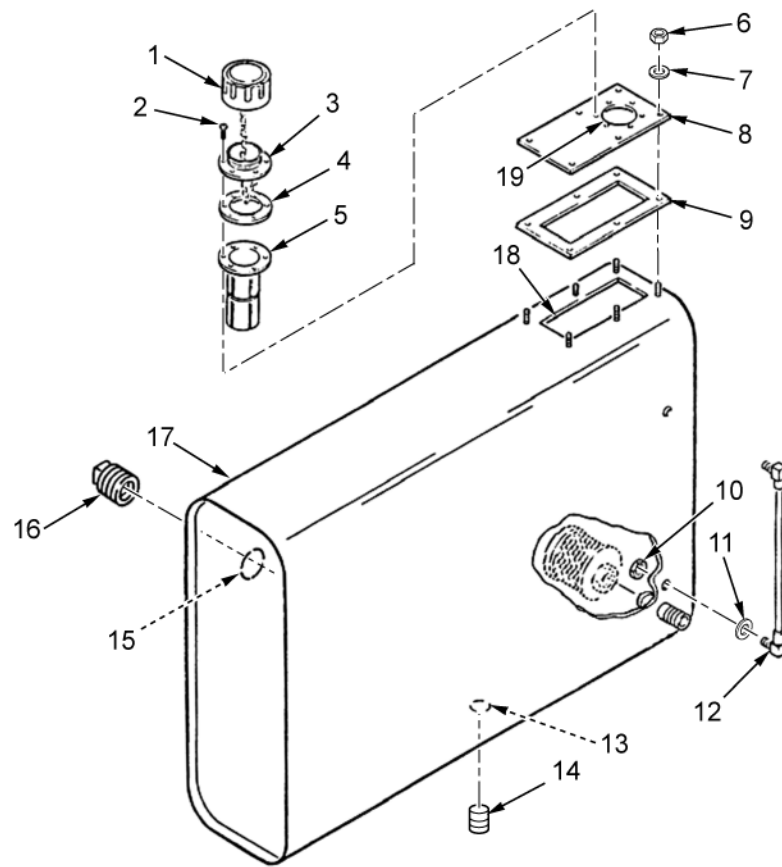
END OF TASK

INSTALLATION**CAUTION**

Apply pipe sealant compound to all male pipe threads of hydraulic fitting, using only enough compound to coat the threads. DO NOT allow the compound to enter a component/fitting or the compound may restrict fluid passages and damage to equipment or equipment failure may result.

Note positioning/orientation of fittings on the illustrations. It is important to have the tightened fitting positioned as shown so that hoses are not too short and fittings DO NOT interfere with one another, or damage to equipment may result.

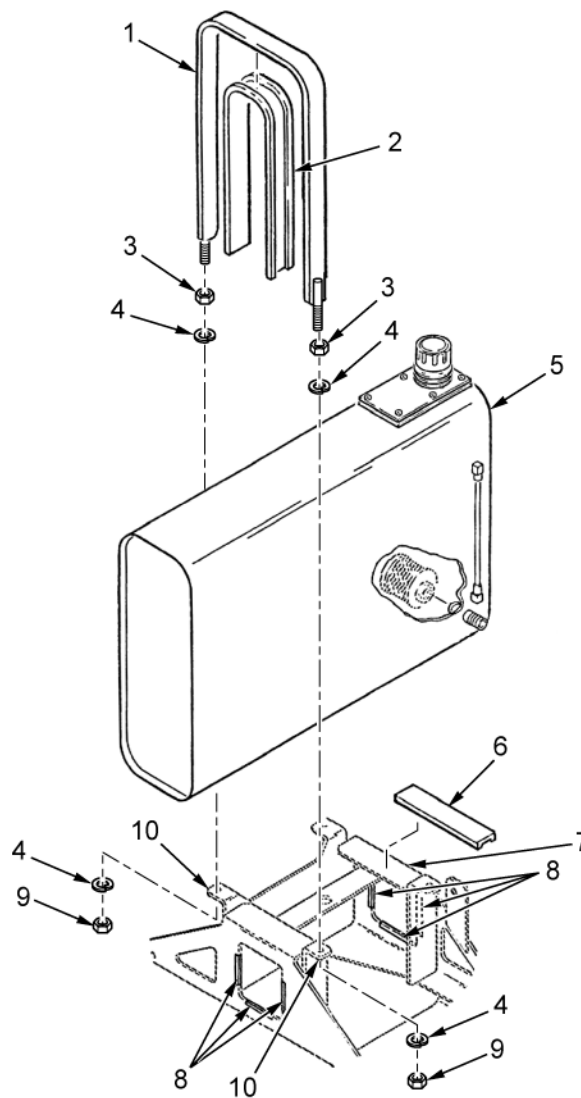
1. If removed, apply pipe sealant to threads of pipe plug (Figure 3, Item 14). Remove cap/plug installed in tank opening (Figure 3, Item 13) in bottom of hydraulic tank (Figure 3, Item 17) and install pipe plug (Figure 3, Item 14). If removed, install hydraulic tank filter (WP 0123).
2. Apply pipe sealant to all threads of pipe plug (Figure 3, Item 16). Remove caps/plugs from cover opening (Figure 3, Item 15) on hydraulic tank (Figure 3, Item 17) and install pipe plug (Figure 3, Item 16).
3. Lubricate two new preformed packings (Figure 3, Item 11) with petroleum jelly. Remove caps/plugs and install two new preformed packings and sight indicator (Figure 3, Item 12) onto hydraulic tank (Figure 3, Item 17) and secure with two nuts (Figure 3, Item 10).
4. Remove wiping rag from cover opening (Figure 3, Item 19) and install new gasket (Figure 3, Item 9) and access cover (Figure 3, Item 8) onto the cover opening (Figure 3, Item 18) on hydraulic tank (Figure 3, Item 17). Secure with six washers (Figure 3, Item 7) and nuts (Figure 3, Item 6).
5. If removed, install filter (Figure 3, Item 5), new gasket (Figure 3, Item 4), and filler neck (Figure 3, Item 3) onto access cover (Figure 3, Item 8) and secure with six screws (Figure 3, Item 2). Install filler cap (Figure 3, Item 1).



HETT0806

Figure 3. Hydraulic Tank Assembly.

6. Install six moldings (Figure 4, Item 8) and two retaining (protective molding) straps (Figure 4, Item 6) onto APU frame (Figure 4, Item 7).
7. Install hydraulic tank (Figure 4, Item 5), slant bottom of tank rearward, and set in place on APU frame (Figure 4, Item 7).
8. Install four nuts (Figure 4, Item 3) onto two clamp bolt assemblies (Figure 4, Item 1). By hand, thread four nuts upward onto clamp bolt assemblies.
9. Install two clamp bolt (protective molding) assemblies (Figure 4, Item 2) in position on hydraulic tank (Figure 4, Item 5). Install two clamp bolt assemblies (Figure 4, Item 1) over clamp bolt (protective molding) assemblies (Figure 4, Item 2) and use one person to hold in place over mounting holes (Figure 4, Item 10) on APU frame (Figure 4, Item 7).
10. Install four new lockwashers (Figure 4, Item 4) onto two clamp bolt assemblies (Figure 4, Item 1). Lower two clamp bolt assemblies through mounting holes (Figure 4, Item 10) down onto APU frame (Figure 4, Item 7).
11. Secure hydraulic tank (Figure 4, Item 5) in place with four new lockwashers (Figure 4, Item 4) and four nuts (Figure 4, Item 9). Tighten four nuts (Figure 4, Item 9) on two clamp bolt assemblies (Figure 4, Item 1) and tighten four nuts (Figure 4, Item 3) on two clamp bolt assemblies (Figure 4, Item 1) down firmly against APU frame (Figure 4, Item 7).



HETT0807

Figure 4. Hydraulic Tank Assembly.

END OF TASK

FOLLOW-ON MAINTENANCE

Reconnect APU hydraulics to hydraulic tank (WP 0117).

Install gooseneck steps removed (WP 0087).

Check/fill hydraulic tank as required (WP 0039).

Install battery (WP 0053).

Perform hydraulic system bleeding (WP 0041).

END OF WORK PACKAGE

FIELD MAINTENANCE**GOOSENECK CYLINDER AIR RESERVOIR**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (SATS) (WP 0168, Item 28)

Lockwasher (4) (TM 9-2330-381-24P)

Personnel Required

1

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Hydraulic Fluid (WP 0170, Item 17)
Pipe Sealant (WP 0170, Item 22)
Solvent, Dry Cleaning (WP 0170, Item 32)

Equipment Conditions

Gooseneck coupled to tractor or supported by gooseneck stand (Tractor/Semitrailer Coupling and Uncoupling [WP 0013])

GENERAL INFORMATION

This work package provides instructions for the removal, repair, and installation of the gooseneck cylinder air reservoir.

REMOVAL**WARNING**

- Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into eyes, flush immediately with water and seek medical attention. If hydraulic fluid gets on skin, wash thoroughly with soap and water. Wash hands thoroughly prior to eating or smoking.
- Hydraulic fluid may be hot if system has been in operation. Allow time to cool before performing maintenance, or injury to personnel may result.

Failure to follow this warning may result in serious injury to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or foreign material from entering the hydraulic system, or damage to equipment may result.

NOTE

Place drain pan under reservoir to catch fluid.

1. Tag and disconnect hydraulic hose (Figure 1, Item 1) from straight pipe-to-tube adapter (Figure 1, Item 3) on reservoir (Figure 1, Item 2). Allow fluid to drain from reservoir into drain pan. Install caps/plugs in hose opening.
2. Remove breather valve (Figure 1, Item 8) and check valve (Figure 1, Item 7) from reservoir (Figure 1, Item 2). Allow all fluid in reservoir to drain into drain pan. Install caps/plugs into openings.
3. Remove safety relief valve (Figure 1, Item 9) and straight pipe-to-tube adapter (Figure 1, Item 3) from reservoir (Figure 1, Item 2). Install caps/plugs in all openings.
4. While supporting reservoir (Figure 1, Item 2), remove four nuts (Figure 1, Item 6), lockwashers (Figure 1, Item 5), and reservoir from platform (Figure 1, Item 4). Discard lockwashers.

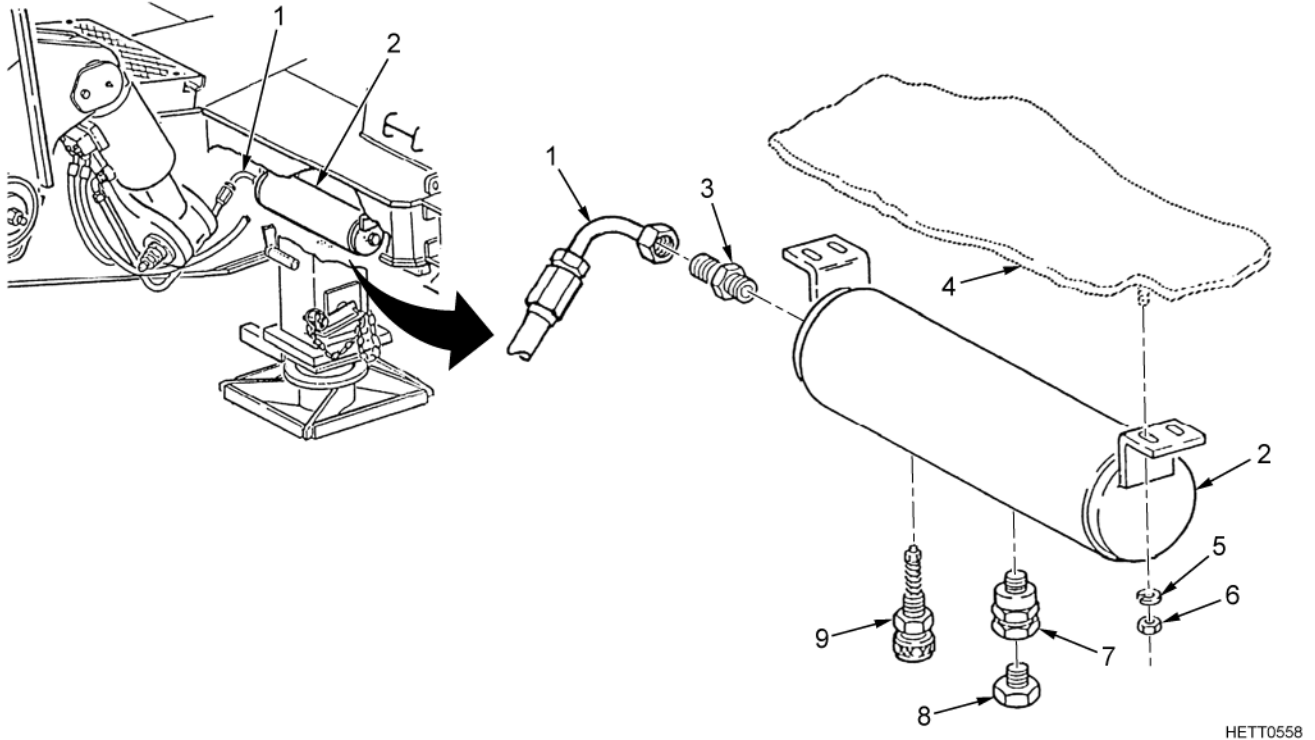


Figure 1. Gooseneck Cylinder Air Reservoir Removal.

5. Strain drained hydraulic fluid and check for evidence of metal or gasket particles, which may indicate impending failure of streetside gooseneck cylinder.

END OF TASK

REPAIR

WARNING**SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
- The flashpoint for Type II solvent cleaning compound is 141° to 198°F (61° to 92°C) and for Type III it is 200° to 241°F (93° to 116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound.
- Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.
- Compressed air used for cleaning/drying can create airborne particles that may injure the eyes. Always wear eye protection. Pressure must not exceed 30 psi (207 kPa) or injury to personnel may result.

Failure to follow these warnings may result in injury or death to personnel.

1. Inspect interior of tank for mold, mildew, or fungus. Clean interior of tank thoroughly with dry cleaning solvent to ensure all mold, mildew, and fungus have been removed. Clean all parts removed with dry cleaning solvent.
2. Inspect all components for nicks, burrs, dents, corrosion, stripped threads, broken castings, and pitting. If parts are defective, replace as required.

END OF TASK

INSTALLATION**CAUTION**

Apply pipe sealant compound to all male pipe threads of hydraulic fitting, using only enough compound to coat the threads. DO NOT allow the compound to enter a component/fitting, or the compound may restrict or block fluid passages and damage to equipment or equipment failure may result.

1. Apply pipe sealant to all male threads. Remove caps/plugs and install check valve (Figure 1, Item 7), breather (Figure 1, Item 8), and safety relief valve (Figure 1, Item 9) to air reservoir (Figure 1, Item 2).
2. Pour approximately 1/2 cup (0.2 l) hydraulic fluid into reservoir (Figure 1, Item 2) and roll reservoir around so that interior of reservoir is coated with hydraulic fluid.
3. Apply pipe sealant to all male threads. Remove caps/plugs and install straight pipe-to-tube adapter (Figure 1, Item 3) to reservoir (Figure 1, Item 2).
4. Install reservoir (Figure 1, Item 2) onto platform (Figure 1, Item 4) and secure with four new lockwashers (Figure 1, Item 5) and nuts (Figure 1, Item 6).
5. Remove caps/plugs and install hydraulic hose (Figure 1, Item 1) onto straight pipe-to-tube adapter (Figure 1, Item 3) to reservoir (Figure 1, Item 2).

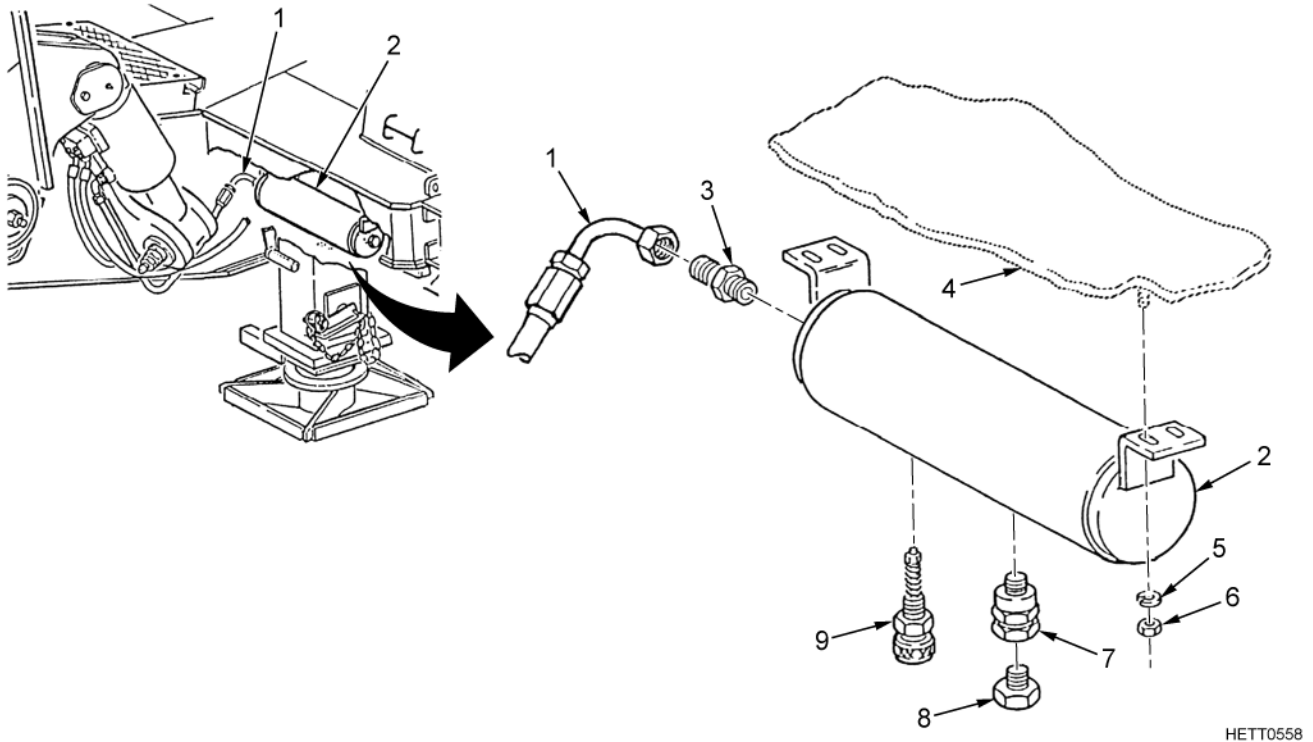


Figure 2. Gooseneck Cylinder Air Reservoir Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Adjust gooseneck and check for leakage at reservoir (WP 0007).

END OF WORK PACKAGE

FIELD MAINTENANCE**AUXILIARY POWER UNIT (APU)**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)

Materials/Parts

Lockwasher (TM 9-2330-381-24P)

Locknut (4) (TM 9-2330-381-24P)

Personnel Required

2

Equipment Conditions

Bolts (2) and hydraulic pump (with hoses attached)
removed from APU (Hydraulic Pump [WP 0107])

Throttle cable disconnected from speed control lever
(Mechanical Throttle Control [WP 0139])

APU wiring harness uncoupled (APU Wiring Harness
[WP 0064])

Battery cables disconnected from battery and removed
from APU (Battery Installation [WP 0053])

Handrails removed (Gooseneck Guardrails [WP 0088])

Top and rear hinged steps removed (Gooseneck Steps
[WP 0087])

Gooseneck coupled (Tractor/Semitrailer Coupling and
Uncoupling [WP 0013]) or supported at 64 in. (162.6 cm)
height

GENERAL INFORMATION

This work package provides information for the removal and installation of the Auxiliary Power Unit (APU).

REMOVAL**WARNING**

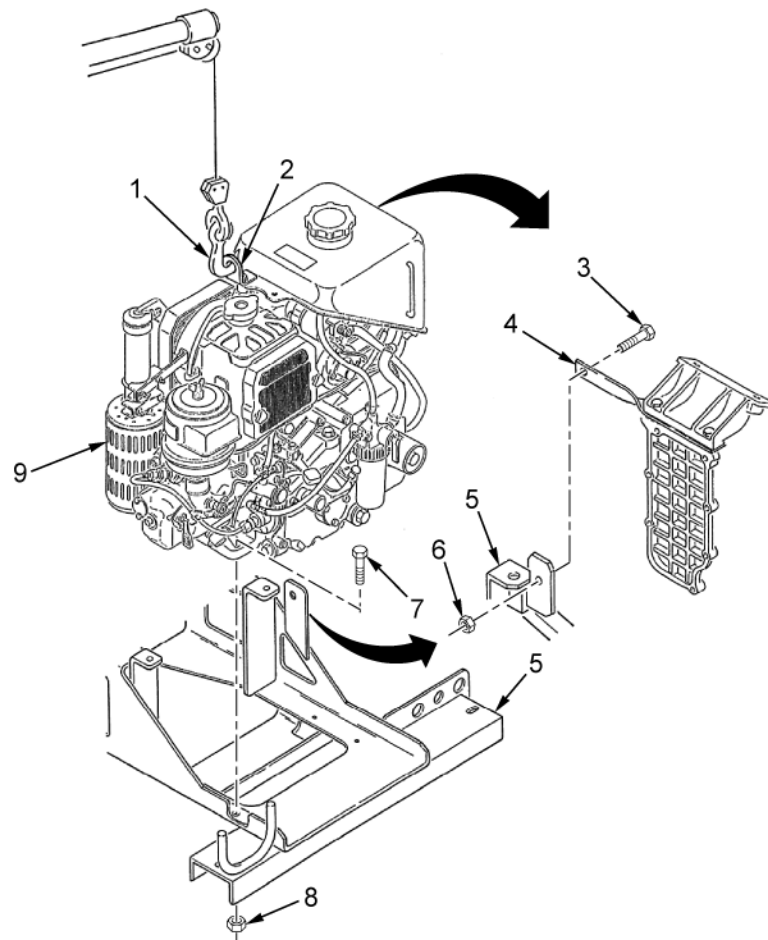
Auxiliary Power Unit (APU) must be cool before removal. Failure to follow this warning may result in personnel being burned and injury.

1. Remove locknut (Figure 1, Item 6) and bolt (Figure 1, Item 3) from APU fuel tank bracket (Figure 1, Item 4) and APU frame (Figure 1, Item 5). Discard locknut.
2. Attach davit hook (Figure 1, Item 1) to lifting eye (Figure 1, Item 2) on APU (Figure 1, Item 9).
3. Remove four bolts (Figure 1, Item 7) and locknuts (Figure 1, Item 8) from APU frame (Figure 1, Item 5). Discard locknuts.

CAUTION

When removing/installing the APU, use extreme caution to prevent the APU from contacting the hydraulic tank, or damage to equipment may result.

4. Use two personnel to lift APU (Figure 1, Item 9) from APU frame (Figure 1, Item 5) and lower APU to ground. If necessary, remove davit hook (Figure 1, Item 1) from lifting eye (Figure 1, Item 2) on APU.



HETT0559

Figure 1. APU.

END OF TASK

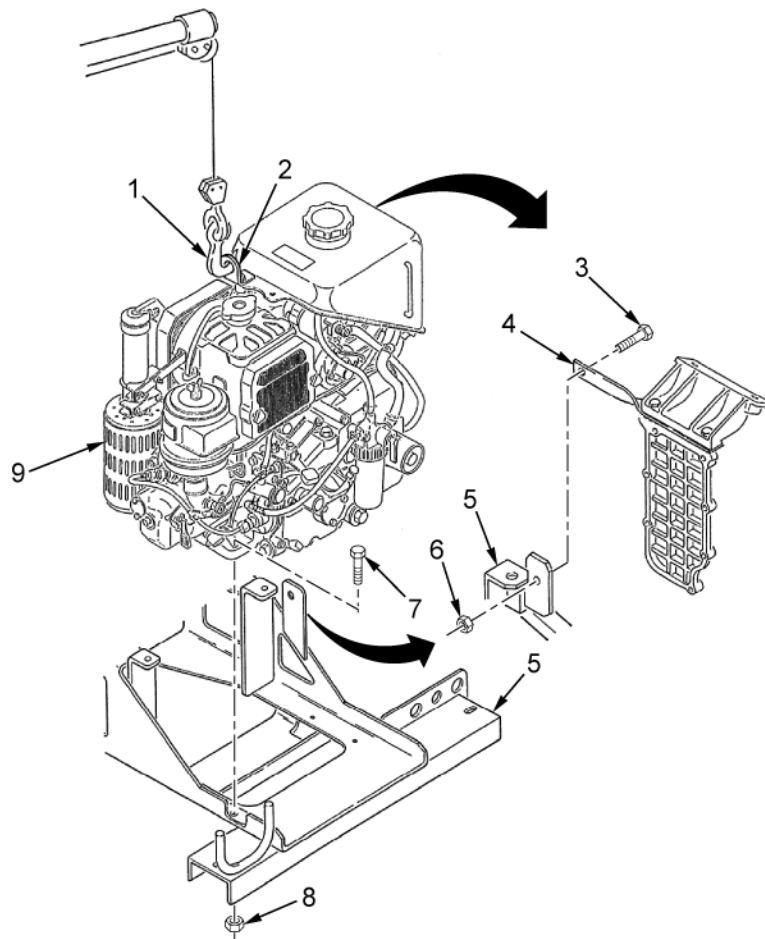
INSTALLATION

1. If removed, attach davit hook (Figure 2, Item 1) to lifting eye (Figure 2, Item 2) on APU (Figure 2, Item 9).

CAUTION

When removing/installing APU, use extreme caution to prevent the APU from contacting the hydraulic tank, or damage to equipment may result.

2. Use two personnel to raise APU (Figure 2, Item 9) (above gooseneck) and lower in position on APU frame (Figure 2, Item 5). Secure APU with four bolts (Figure 2, Item 7) and new locknuts (Figure 2, Item 8).
3. Remove davit hook (Figure 2, Item 1) from lifting eye (Figure 2, Item 2) on APU (Figure 2, Item 9).
4. Align fuel tank bracket (Figure 2, Item 4) with APU frame (Figure 2, Item 5) and secure in place by installing bolt (Figure 2, Item 3) and new locknut (Figure 2, Item 6).



HETT0559

Figure 2. APU.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**GLOW PLUG**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)

Personnel Required

1

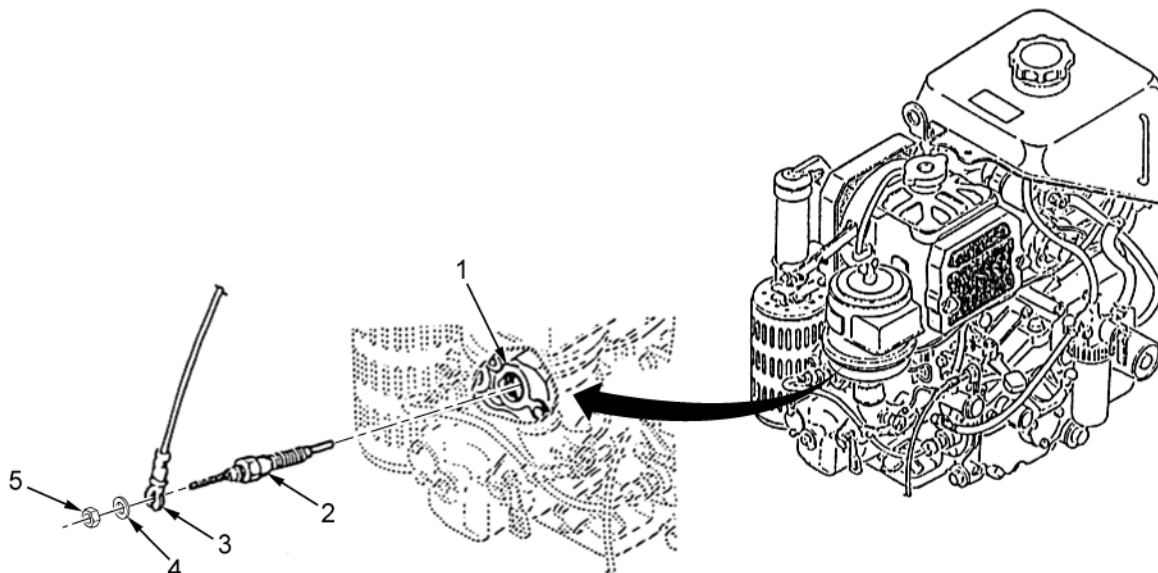
Equipment ConditionsStep assembly raised (WP 0035)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the glow plug.

REMOVAL

1. Remove nut (Figure 1, Item 5) and washer (Figure 1, Item 4). Disconnect wiring harness (Figure 1, Item 3) from glow plug (Figure 1, Item 2).
2. Remove glow plug (Figure 1, Item 2) from cylinder head (Figure 1, Item 1).



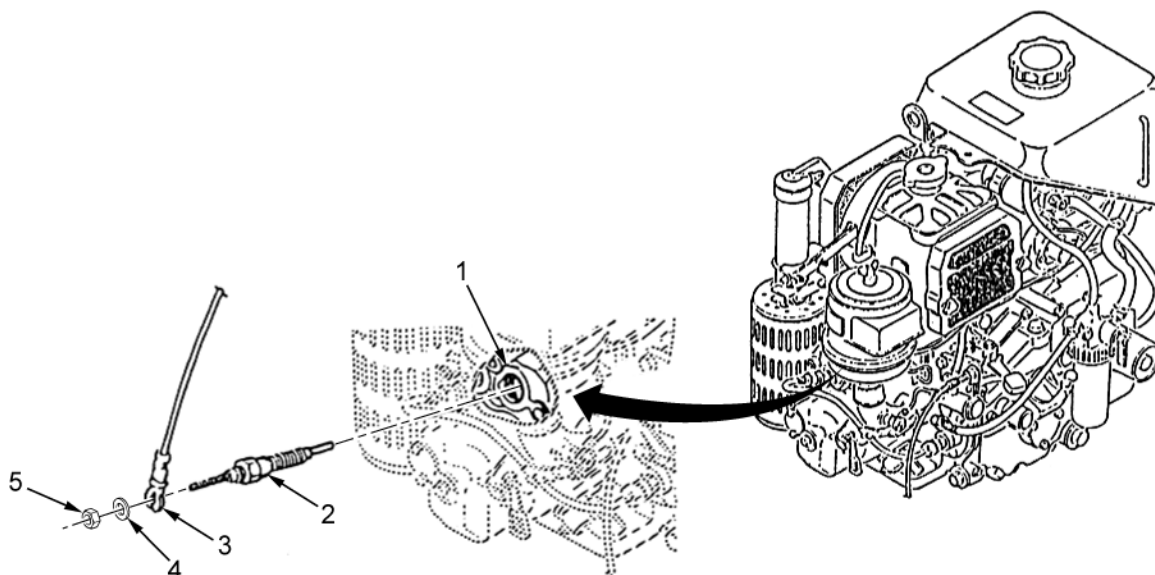
HETT0560

Figure 1. Glow Plug Removal.

END OF TASK

INSTALLATION

1. Install glow plug (Figure 2, Item 2) in cylinder head (Figure 2, Item 1).
2. Connect wiring harness (Figure 2, Item 3) to glow plug (Figure 2, Item 2) and secure with washer (Figure 2, Item 4) and nut (Figure 2, Item 5).



HETT0560

Figure 2. Glow Plug Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Start Auxiliary Power Unit (APU) and check glow plug for operation (WP 0005).

END OF WORK PACKAGE

FIELD MAINTENANCE**DRAIN COCK**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)

Equipment Conditions

Radiator drained (WP 0142)

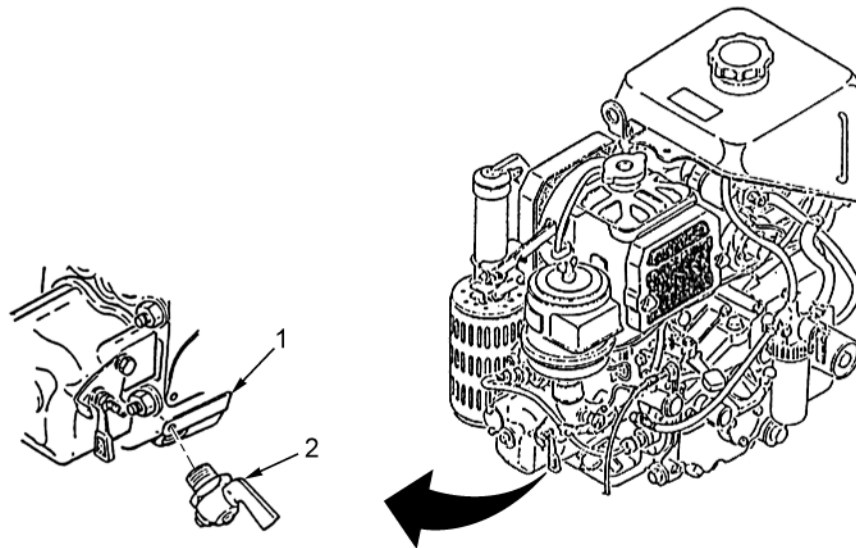
Personnel Required1

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the drain cock.

REMOVAL

1. Remove drain cock (Figure 1, Item 2) from cylinder head (Figure 1, Item 1).



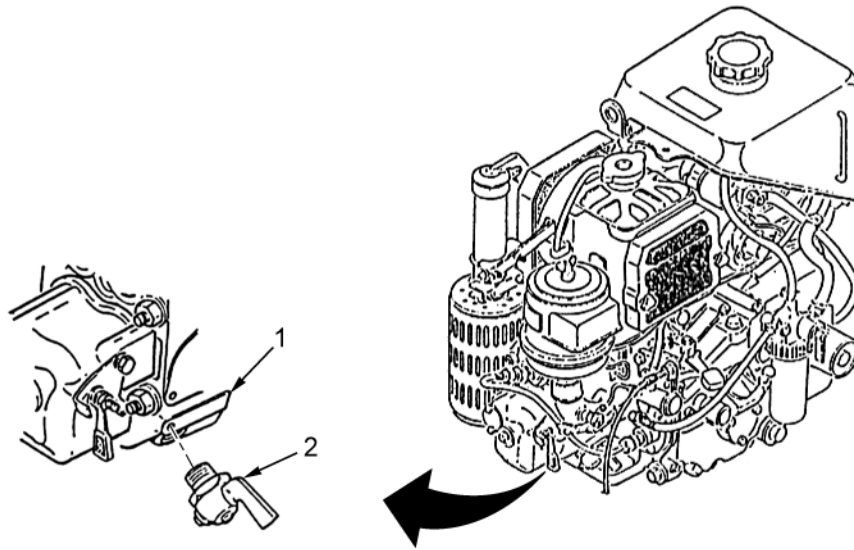
HETT0561

Figure 1. Drain Cock.

END OF TASK

INSTALLATION

1. Install drain cock (Figure 1, Item 2) into cylinder head (Figure 1, Item 1).



HETT0561

Figure 2. Drain Cock.

END OF TASK**FOLLOW-ON MAINTENANCE**

Fill radiator with coolant (WP 0142).

END OF WORK PACKAGE

FIELD MAINTENANCE**COVER TRANSMISSION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (SATS) (WP 0168, Item 28)

Preformed Packing (TM 9-2330-381-24P)

Self-Locking Nut (TM 9-2330-381-24P)

Personnel Required

1

Materials/Parts

Oil, Lubricating SAE 10W-30 (WP 0170, Item 20)
Gasket (TM 9-2330-381-24P)
Gasket (TM 9-2330-381-24P)
Lockwasher (TM 9-2330-381-24P)

Equipment Conditions

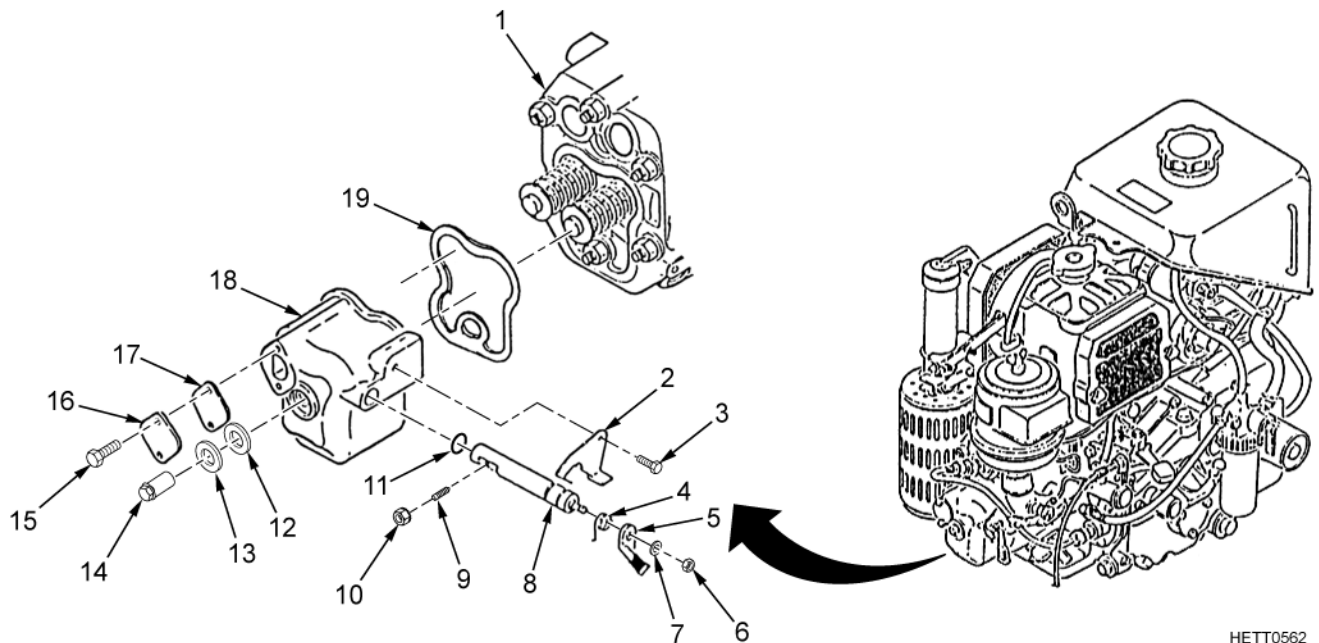
Engine oil drained (WP 0132)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the cover transmission.

REMOVAL

1. Remove sleeve nut (Figure 1, Item 14), washer (Figure 1, Item 13), and gasket (Figure 1, Item 12) from cover transmission (Figure 1, Item 18). Discard gasket.
2. Remove cover transmission (Figure 1, Item 18) and gasket (Figure 1, Item 19) from cylinder head (Figure 1, Item 1). Discard gasket.
3. Remove two bolts (Figure 1, Item 15), decompression hole cover (Figure 1, Item 16), and gasket (Figure 1, Item 17) from cover transmission (Figure 1, Item 18). Discard gasket.
4. Remove bolt (Figure 1, Item 3), retaining plate (Figure 1, Item 2), and straight shaft (Figure 1, Item 8) from cover transmission (Figure 1, Item 18).
5. Disassemble nut (Figure 1, Item 6), lockwasher (Figure 1, Item 7), manual control lever (Figure 1, Item 5), spring (Figure 1, Item 4), self-locking nut (Figure 1, Item 10), setscrew (Figure 1, Item 9), and preformed packing (Figure 1, Item 11) from straight shaft (Figure 1, Item 8). Discard lockwasher, self-locking nut, and preformed packing.



HETT0562

Figure 1. Cover Transmission.

END OF TASK

INSTALLATION

1. Assemble new preformed packing (Figure 2, Item 11), setscrew (Figure 2, Item 9), new self-locking nut (Figure 2, Item 10), spring (Figure 2, Item 4), manual control lever (Figure 2, Item 5), new lockwasher (Figure 2, Item 7), and nut (Figure 2, Item 6) to straight shaft (Figure 2, Item 8).
2. Install straight shaft (Figure 2, Item 8), retaining plate (Figure 2, Item 2), and bolt (Figure 2, Item 3) on cover transmission (Figure 2, Item 18).
3. Install new gasket (Figure 2, Item 19) and cover transmission (Figure 2, Item 18) on cylinder head (Figure 2, Item 1).
4. Install new gasket (Figure 2, Item 12), washer (Figure 2, Item 13), and sleeve nut (Figure 2, Item 14) on cover transmission (Figure 2, Item 18). Torque sleeve nut (Figure 2, Item 14) to 86 to 96 lb-in (9.8 to 10.8 Nm).
5. Install new gasket (Figure 2, Item 17), decompression hole cover (Figure 2, Item 16), and two bolts (Figure 2, Item 15) on cover transmission (Figure 2, Item 18).

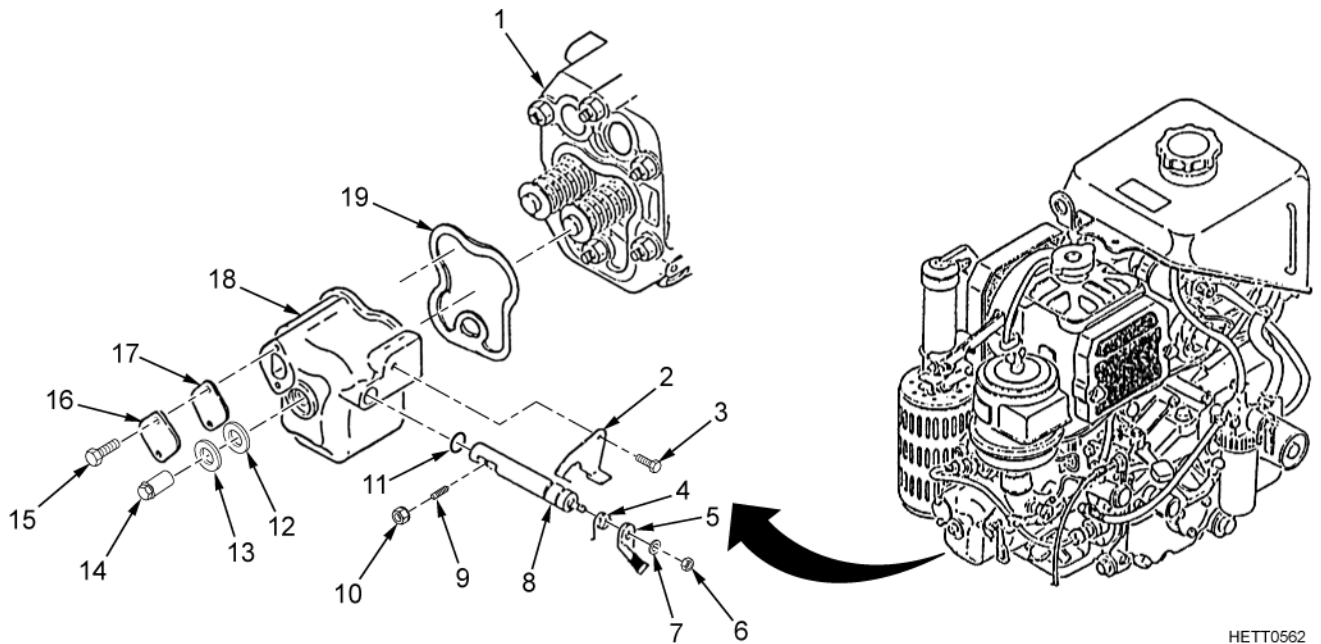


Figure 2. Cover Transmission.

END OF TASK**FOLLOW-ON MAINTENANCE**

Fill crankcase with engine oil (WP 0132).

END OF WORK PACKAGE

FIELD MAINTENANCE

OIL FILTER AND DIPSTICK

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (SATS) (WP 0168, Item 28)

Personnel Required

1

Materials/Parts

Oil, Lubricating SAE 10W-30 (WP 0170, Item 20)
Preformed Packing (TM 9-2330-381-24P)

Equipment Conditions

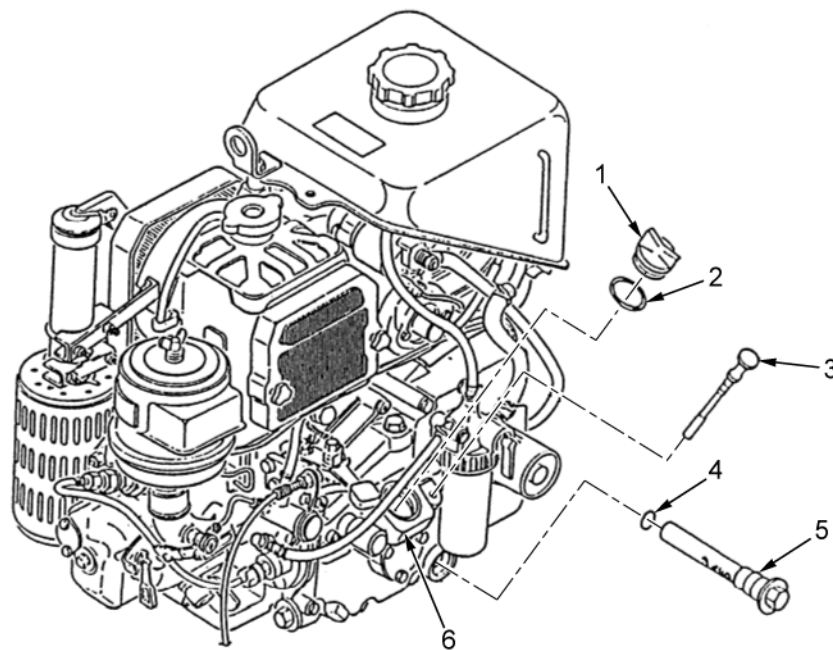
Step assembly raised (WP 0005)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the oil filter and dipstick.

REMOVAL

1. Remove oil filter (Figure 1, Item 5) from engine cover (Figure 1, Item 6) and drain engine oil in drain pan. Slide preformed packing (Figure 1, Item 4) off of oil filter. Discard preformed packing.
2. Remove oil dipstick (Figure 1, Item 3) and oil filler plug (Figure 1, Item 1) from engine cover (Figure 1, Item 6). Remove preformed packing (Figure 1, Item 2) from oil filler plug. Discard preformed packing.
3. Clean oil filter with clean oil.



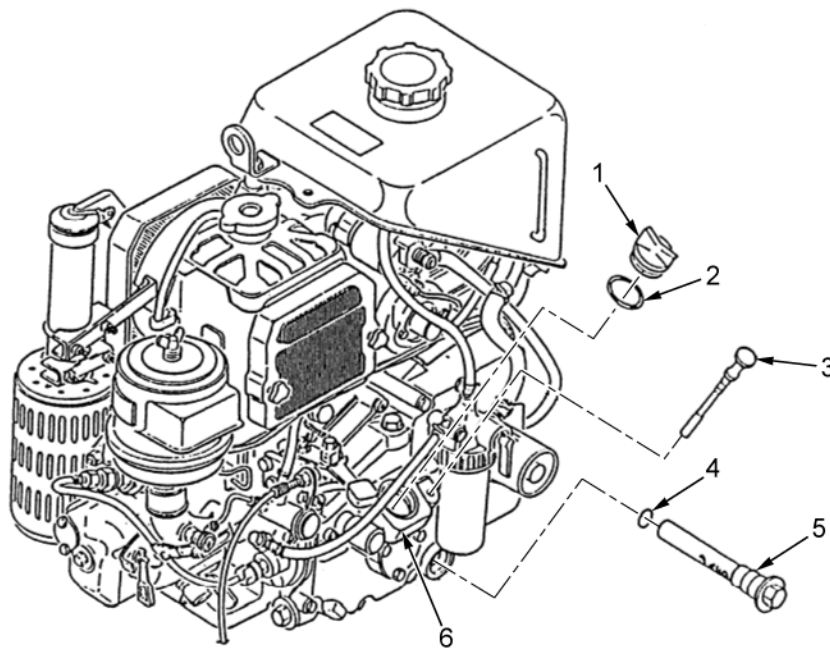
HETT0563

Figure 1. Oil Filter and Dipstick.

END OF TASK

INSTALLATION

1. Install new preformed packing (Figure 2, Item 2) on oil filler plug (Figure 2, Item 1). Install oil filler plug and oil dipstick (Figure 2, Item 3) on crankcase engine cover (Figure 2, Item 6).
2. Slide new preformed packing (Figure 2, Item 4) onto oil filter (Figure 2, Item 5) and install oil filter.
3. Fill engine with engine oil (approximately 1.37 qt [1.3 l]).



HETT0563

Figure 2. Oil Filter and Dipstick.

END OF TASK**FOLLOW-ON MAINTENANCE**

Start Auxiliary Power Unit (APU) and check oil pressure indicators (WP 0005).

END OF WORK PACKAGE

FIELD MAINTENANCE**OIL SENDING UNIT**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (SATS) (WP 0168, Item 28)

Materials/Parts

Gasket (TM 9-2330-381-24P)

Personnel Required

1

Equipment Conditions

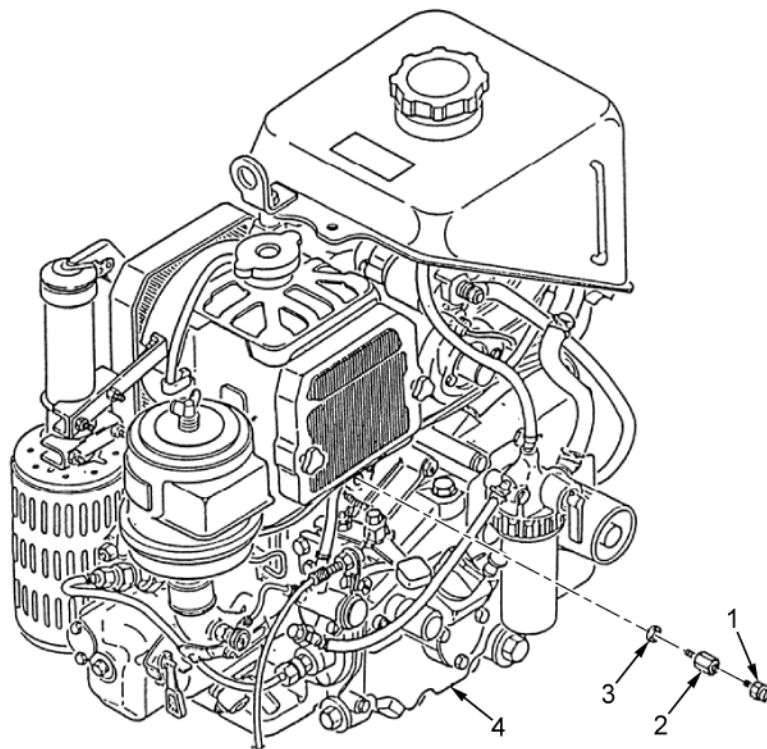
Auxiliary Power Unit (APU) wiring harness disconnected
(WP 0064)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the oil sending unit.

REMOVAL

1. Remove oil pressure transducer (Figure 1, Item 1), electrical connector retainer (Figure 1, Item 2), and gasket (Figure 1, Item 3) from crankcase (Figure 1, Item 4). Discard gasket.



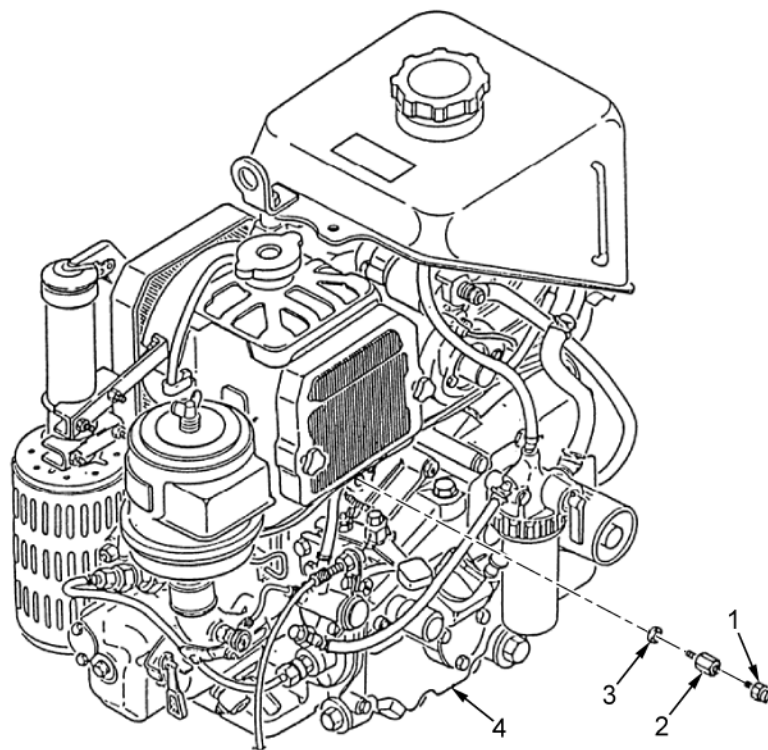
HETT0564

Figure 1. Oil Sending Unit.

END OF TASK

INSTALLATION

1. Install new gasket (Figure 2, Item 3) and electrical connector retainer (Figure 2, Item 2) in crankcase (Figure 2, Item 4). Torque electrical connector retainer to 129 to 174 lb-in (14.6 to 19.7 Nm).
2. Install oil pressure transducer (Figure 2, Item 1) onto electrical connector retainer (Figure 2, Item 2). Torque oil pressure transducer to 60 to 86 lb-in (6.7 to 9.8 Nm).



HETT0564

Figure 2. Oil Sending Unit.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
NOZZLE HOLDER ASSEMBLY

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Personnel Required

1

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Seal (TM 9-2330-381-24P)
Gasket (TM 9-2330-381-24P)

Equipment Conditions

Fuel tank drained (WP 0136)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the nozzle holder assembly.

REMOVAL**WARNING**

Diesel fuel is combustible and is an irritant to the eyes, skin, and respiratory system. To avoid explosion and injury to personnel, extinguish all smoking materials and **DO NOT** allow sparks or open flame near the fuel tank or the fuel system. Use skin and eye protection and work in a well-ventilated area. Clean up any fuel that is spilled during fuel line tank removal. Failure to follow this warning may result in injury to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or other foreign material from entering the fuel system. Failure to follow this warning may result in damage to equipment.

1. Loosen two hose clamps (Figure 1, Item 3), straighten hose clamp (Figure 1, Item 1), and remove hose (Figure 1, Item 2) from fuel injector holder (Figure 1, Item 9). Drain excess fuel from hose in drain pan and cap/plug hose.
2. Remove screw (Figure 1, Item 5), two nuts (Figure 1, Item 4), and metallic tube (Figure 1, Item 6) from the fuel injector holder (Figure 1, Item 9). Drain excess fuel from tube in drain pan and cap/plug tube.
3. On engine model EB300-D, remove fuel injector holder (Figure 1, Item 9) and gasket (Figure 1, Item 10) from fuel injector (Figure 1, Item 11). Discard gasket.
4. On engine model EB300-E, remove nut (Figure 1, Item 12), nozzle holder (Figure 1, Item 13), fuel injector holder (Figure 1, Item 14), gasket (Figure 1, Item 15), and seal (Figure 1, Item 16) from fuel injector (Figure 1, Item 11). Discard seal.
5. Remove screw (Figure 1, Item 7) and loop clamp (Figure 1, Item 8) from metallic tube (Figure 1, Item 6).

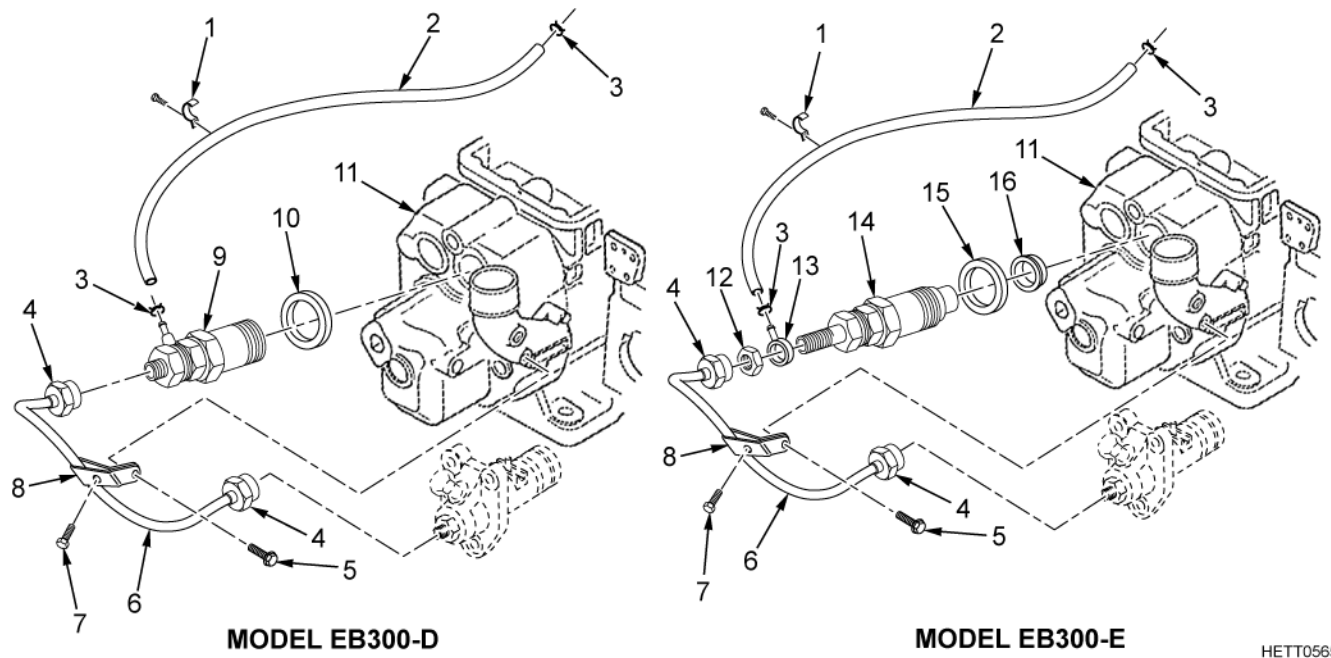
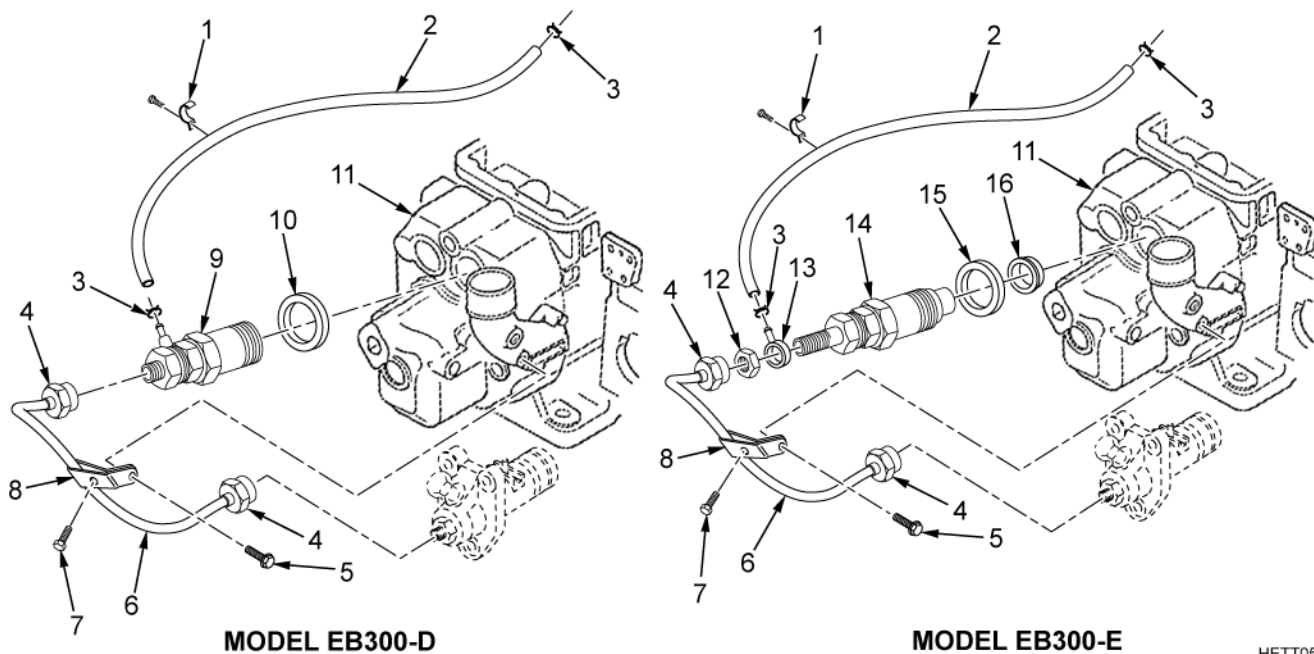


Figure 1. Nozzle Holder Assembly.

END OF TASK

INSTALLATION

1. Install loop clamp (Figure 2, Item 8) and screw (Figure 2, Item 7) to metallic tube (Figure 2, Item 6).
2. On engine model EB300-E, install new seal (Figure 2, Item 16), new gasket (Figure 2, Item 15), fuel injector holder (Figure 2, Item 14), nozzle holder (Figure 2, Item 13), and nut (Figure 2, Item 12) to fuel injector (Figure 2, Item 11). Tighten nut.
3. On engine model EB300-D, install gasket (Figure 2, Item 10) and fuel injector holder (Figure 2, Item 9) to fuel injector (Figure 2, Item 11). Tighten fuel injector holder (Figure 2, Item 9).
4. Remove and stow caps/plugs. Install metallic tube (Figure 2, Item 6), tighten two nuts (Figure 2, Item 4), and install screw (Figure 2, Item 5) to fuel injector (Figure 2, Item 11).
5. Remove and stow caps/plugs. Install hose (Figure 2, Item 2) to fuel injector holder (Figure 2, Item 9) on the EB300-D, or to nozzle holder (Figure 2, Item 13) on the EB300-E. Secure with two hose clamps (Figure 2, Item 3).
6. Secure hose (Figure 2, Item 2) with hose clamp (Figure 2, Item 1).



HETT0565

Figure 2. Nozzle Holder Assembly.

END OF TASK

FOLLOW-ON MAINTENANCE

Fill fuel tank with diesel fuel (WP 0136).

END OF WORK PACKAGE

FIELD MAINTENANCE**AIR CLEANER ASSEMBLY**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Gasket (TM 9-2330-381-24P)

Equipment Conditions

Step assembly raised (WP 0005)

Materials/Parts

Rag, Wiping, Cotton, and Cotton Synthetic (WP 0170, Item 23)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the air cleaner assembly.

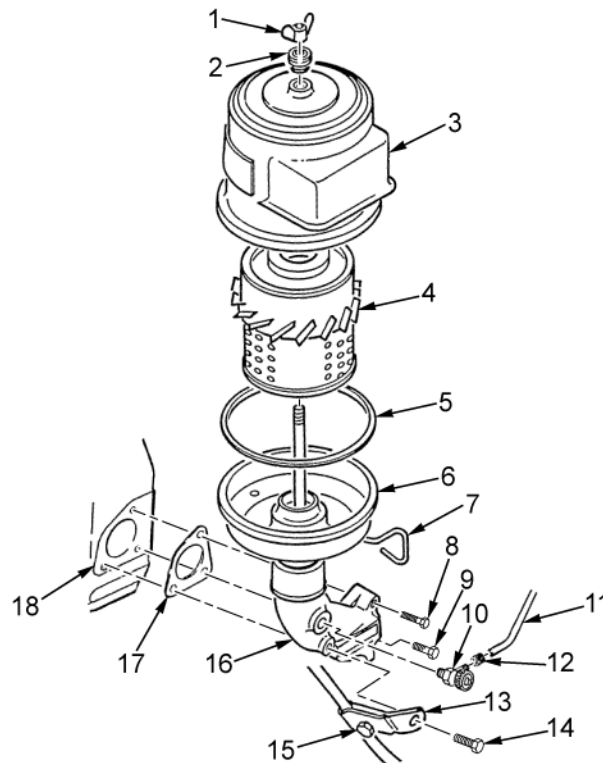
REMOVAL

WARNING

If Nuclear, Biological, and Chemical (NBC) exposure is suspected, all air filter media should be handled by personnel wearing protective equipment. Consult your unit NBC Officer or NBC Noncommissioned Officer (NCO) for appropriate handling or disposal instructions.

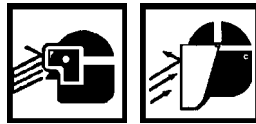
Failure to follow this warning may result in injury or death to personnel.

1. Loosen bolt (Figure 1, Item 15) and remove bolt (Figure 1, Item 14) and bracket (Figure 1, Item 13) from flange (Figure 1, Item 16).
2. Remove wingnut (Figure 1, Item 1), grommet (Figure 1, Item 2), cap assembly (Figure 1, Item 3), air filter element (Figure 1, Item 4), and gasket (Figure 1, Item 5) from body (Figure 1, Item 6). Discard gasket.
3. Loosen and slide compression fitting (Figure 1, Item 12) up hose (Figure 1, Item 11) and disconnect hose from flow valve (Figure 1, Item 10).
4. Remove two bolts (Figure 1, Item 8), bolt (Figure 1, Item 9), flange (Figure 1, Item 16), and gasket (Figure 1, Item 17) from air input manifold (Figure 1, Item 18). Discard gasket.
5. Loosen setting bolt (Figure 1, Item 7) and remove body (Figure 1, Item 6) from flange (Figure 1, Item 16).
6. Remove flow valve (Figure 1, Item 10) from flange (Figure 1, Item 16).



HETT0566

Figure 1. Air Cleaner Assembly.

WARNING

To avoid eye or skin injury, **DO NOT** clean with compressed air in excess of 30 psi (207 kPa). Wear goggles or face shield.

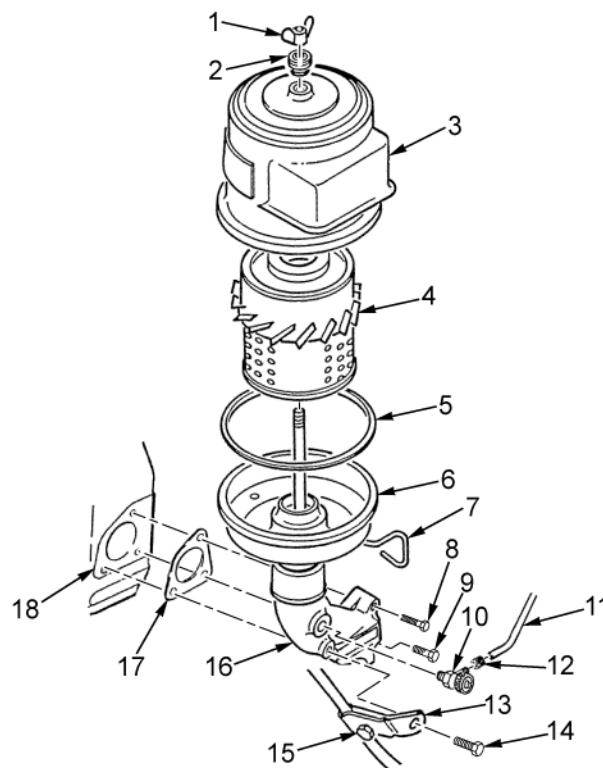
Failure to follow this warning may result in injury or death to personnel.

7. Clean filter element with low-pressure compressed air from inside toward outside. Wipe out body with wiping rag.

END OF TASK

INSTALLATION

1. Install flow valve (Figure 2, Item 10) to flange (Figure 2, Item 16).
2. Install body (Figure 2, Item 6) to flange (Figure 2, Item 16) and tighten setting bolt (Figure 2, Item 7).
3. Install new gasket (Figure 2, Item 17) and flange (Figure 2, Item 16) to air input manifold (Figure 2, Item 18) and secure with bolt (Figure 2, Item 9) and two bolts (Figure 2, Item 8). Torque bolts to 2.2 to 3.6 lb-ft (2.9 to 4.9 Nm).
4. Connect hose (Figure 2, Item 11) to flow valve (Figure 2, Item 10), slide compression fitting (Figure 2, Item 12) up to flow valve, and tighten compression fitting.
5. Install new gasket (Figure 2, Item 5), air filter element (Figure 2, Item 4), cap assembly (Figure 2, Item 3), and grommet (Figure 2, Item 2) to body (Figure 2, Item 6). Secure with wingnut (Figure 2, Item 1).
6. Secure bracket (Figure 2, Item 13) to flange (Figure 2, Item 16) with bolt (Figure 2, Item 14). Tighten bolt (Figure 2, Item 15).



HETT0566

Figure 2. Air Cleaner Assembly.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**FUEL TANK ASSEMBLY**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)

Personnel Required

1

Equipment Conditions

Step assembly raised (WP 0005)

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Fuel, Oil Diesel (WP 0170, Item 13, Item 14, Item 15)
Lockwasher (2) (TM 9-2330-381-24P)

Reference

WP 0136

GENERAL INFORMATION

This work package contains instructions for the removal, repair, and installation of the fuel tank assembly.

REMOVAL**WARNING**

- Diesel fuel is combustible and is an irritant to the eyes, skin, and respiratory system. To avoid injury to personnel and explosion, extinguish all smoking materials and **DO NOT** allow sparks or open flame near the fuel tank or the fuel system. Use skin and eye protection and work in a well-ventilated area.
- Clean up any fuel that is spilled during fuel line removal or injury to personnel may result.

Failure to follow these warnings may result in injury or death to personnel.

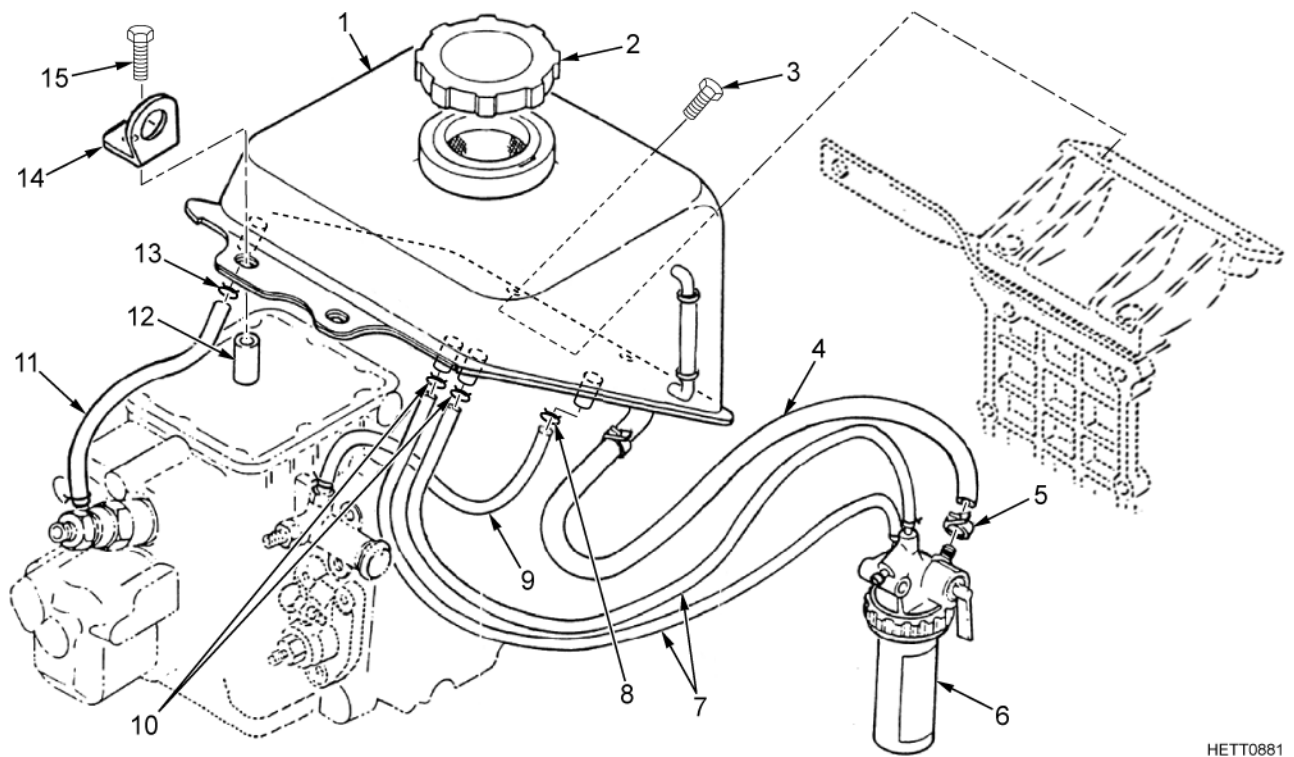
CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or other foreign material from entering the fuel system or damage to equipment may result.

NOTE

Fuel tank capacity is 1.3 gal. (4.8 l).

1. Remove filler cap (Figure 1, Item 2). Loosen hose clamp (Figure 1, Item 5) and disconnect hose (Figure 1, Item 4) from fuel filter (Figure 1, Item 6). Drain fuel in drain pan. Remove hose clamp (Figure 1, Item 5) and cap/plug hose (Figure 1, Item 4).
2. Loosen hose clamp (Figure 1, Item 13) and disconnect hose (Figure 1, Item 11). Remove hose clamp (Figure 1, Item 13) and cap/plug hose (Figure 1, Item 11).
3. Loosen hose clamp (Figure 1, Item 8) and disconnect hose (Figure 1, Item 9). Remove hose clamp (Figure 1, Item 8) and cap/plug hose (Figure 1, Item 9).
4. Loosen two hose clamps (Figure 1, Item 10) and disconnect two hoses (Figure 1, Item 7) from fuel tank (Figure 1, Item 1). Remove two hose clamps (Figure 1, Item 10) and cap/plug hoses (Figure 1, Item 7).
5. Remove two bolts (Figure 1, Item 3), bolt (Figure 1, Item 15), and lifting eye (Figure 1, Item 14). Remove fuel tank (Figure 1, Item 1) and spacer (Figure 1, Item 12).



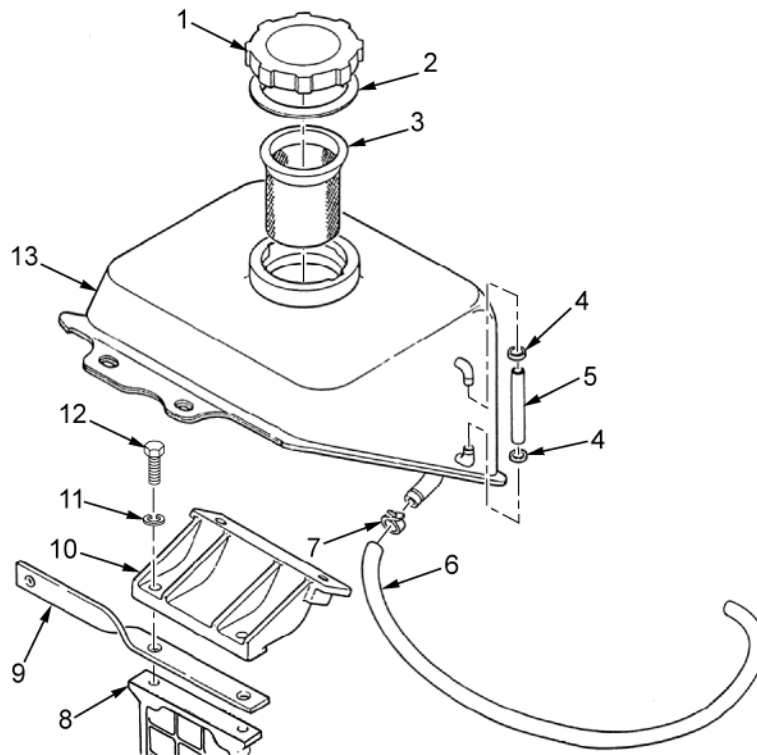
HETT0881

Figure 1. Fuel Tank Removal.

END OF TASK

REPAIR

1. Remove shield (Figure 2, Item 2) from filler cap (Figure 2, Item 1).
2. Loosen hose clamp (Figure 2, Item 7) and remove hose (Figure 2, Item 6). Remove hose clamp (Figure 2, Item 7) and cap/plug hose (Figure 2, Item 6).
3. Remove strainer element (Figure 2, Item 3) from fuel tank (Figure 2, Item 13).
4. Loosen two spring clips (Figure 2, Item 4). Remove sight tubing (Figure 2, Item 5) and install caps/plugs. Remove two spring clips (Figure 2, Item 4).
5. Remove two bolts (Figure 2, Item 12), lockwashers (Figure 2, Item 11), retaining strap (Figure 2, Item 9), and mounting bracket (Figure 2, Item 10).
6. Clean strainer element (Figure 2, Item 3) with clean diesel fuel from the outside toward the inside.
7. Attach mounting bracket (Figure 2, Item 10) and retaining strap (Figure 2, Item 9) to APU (Figure 2, Item 8) with two lockwashers (Figure 2, Item 11) and bolts (Figure 2, Item 12).
8. Remove caps/plugs. Install two spring clips (Figure 2, Item 4) on sight tubing (Figure 2, Item 5). Install sight tubing (Figure 2, Item 5) and tighten two spring clips (Figure 2, Item 4).
9. Install strainer element (Figure 2, Item 3) in fuel tank (Figure 2, Item 13).
10. Remove caps/plugs. Install hose clamp (Figure 2, Item 7) onto hose (Figure 2, Item 6) and install hose onto fuel tank (Figure 2, Item 13). Tighten hose clamp (Figure 2, Item 7) at fuel tank (Figure 2, Item 13).
11. Install shield (Figure 2, Item 2) onto filler cap (Figure 2, Item 1).



HETT0568

Figure 2. Fuel Tank Repair.

FIELD MAINTENANCE**FUEL FILTER ASSEMBLY**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (SATS) (WP 0168, Item 28)

Preformed Packing (TM 9-2330-381-24P)

Personnel Required

1

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Fuel, Oil Diesel (WP 0170, Item 13, Item 14, Item 15)
Filter Element (TM 9-2330-381-24P)

Equipment Conditions

Fuel tank drained (WP 0136)

GENERAL INFORMATION

This work package contains instructions for the removal, repair, and installation of the fuel filter assembly.

REMOVAL**WARNING**

- Diesel fuel is combustible and is an irritant to the eyes, skin, and respiratory system. To avoid injury to personnel and explosion, extinguish all smoking materials and **DO NOT** allow sparks or open flame near the fuel tank or the fuel system. Use skin and eye protection and work in a well-ventilated area.
- Clean up any fuel that is spilled during fuel line removal or injury to personnel may result.

Failure to follow this warning may result in injury or death to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or other foreign material from entering the fuel system or damage to equipment may result.

1. Loosen two hose clamps (Figure 1, Item 11) and disconnect hose (Figure 1, Item 12) from injection pump fitting (Figure 1, Item 13) and fuel filter (Figure 1, Item 10). Collect excess fuel in hose (Figure 1, Item 12) in drain pan. Remove two hose clamps (Figure 1, Item 11) and cap/plug hose (Figure 1, Item 12).
2. Loosen two hose clamps (Figure 1, Item 6) and disconnect hose (Figure 1, Item 7) from fuel tank (Figure 1, Item 2), fitting (Figure 1, Item 5), and fuel filter (Figure 1, Item 10). Collect excess fuel in hose (Figure 1, Item 7) in drain pan. Remove two hose clamps (Figure 1, Item 6) and cap/plug hose (Figure 1, Item 7).
3. Loosen two hose clamps (Figure 1, Item 3) and disconnect hose (Figure 1, Item 4) from fuel tank fitting (Figure 1, Item 1) and fuel filter (Figure 1, Item 10). Collect excess fuel in hose (Figure 1, Item 4) in drain pan. Remove two hose clamps (Figure 1, Item 3) and cap/plug hose (Figure 1, Item 4).
4. Loosen two hose clamps (Figure 1, Item 8) and disconnect hose (Figure 1, Item 14) from fuel tank fitting (Figure 1, Item 15) and fuel filter (Figure 1, Item 10). Collect excess fuel in hose (Figure 1, Item 14) in drain pan. Remove two hose clamps (Figure 1, Item 8) and cap/plug hose (Figure 1, Item 14).
5. Remove bolt (Figure 1, Item 9) and fuel filter assembly (Figure 1, Item 10).

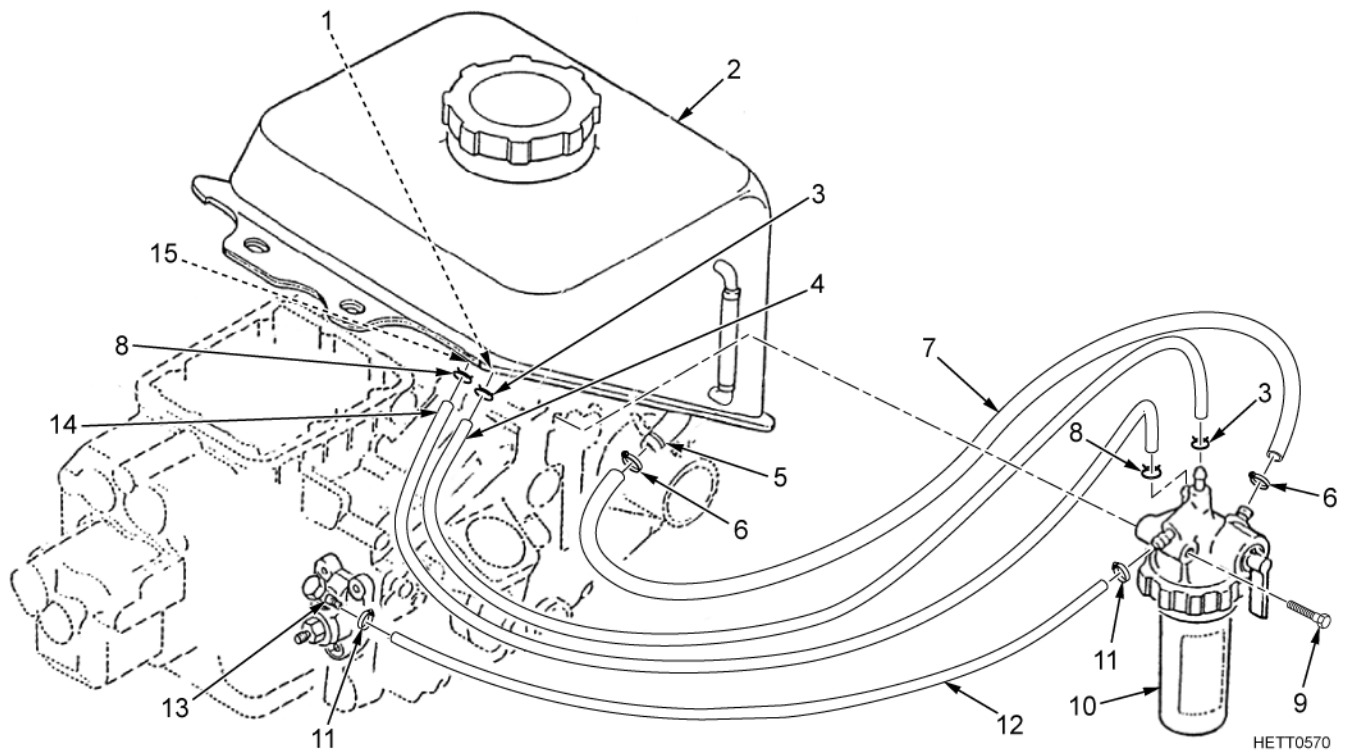
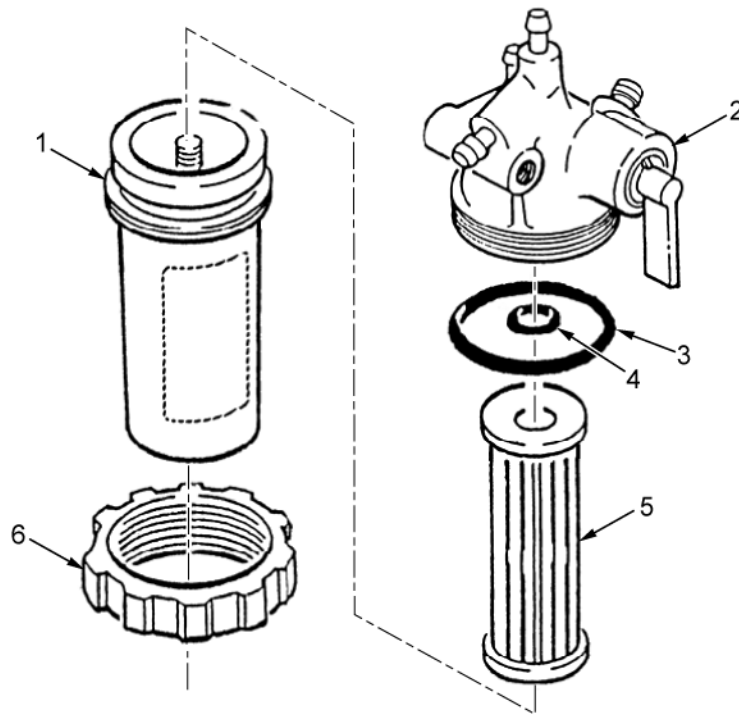


Figure 1. Fuel Filter Removal.

END OF TASK

REPAIR

1. Unscrew retaining ring (Figure 2, Item 6) and remove filter body (Figure 2, Item 1) and filter element (Figure 2, Item 5). Discard filter element.
2. Drain fuel from filter body (Figure 2, Item 1) in drain pan.
3. Remove preformed packing (Figure 2, Item 3) and preformed packing (Figure 2, Item 4) from filter cup (Figure 2, Item 2). Discard preformed packing.
4. Install preformed packing (Figure 2, Item 4) and preformed packing (Figure 2, Item 3) onto filter cup (Figure 2, Item 2).
5. Install filter element (Figure 2, Item 5) in filter body (Figure 2, Item 1).
6. Install filter body (Figure 2, Item 1) onto filter cup (Figure 2, Item 2) and secure by screwing on retaining ring (Figure 2, Item 6).



HETT0571

Figure 2. Fuel Filter Repair.

END OF TASK

INSTALLATION

1. Install fuel filter assembly (Figure 3, Item 10) on APU and secure with bolt (Figure 3, Item 9).
2. Remove caps/plugs, install two hose clamps (Figure 3, Item 8) onto hose (Figure 3, Item 14), and connect hose (Figure 3, Item 14) to fuel tank (Figure 3, Item 2), fitting (Figure 3, Item 15), and fuel filter (Figure 3, Item 10). Tighten two hose clamps (Figure 3, Item 8).
3. Remove caps/plugs, install two hose clamps (Figure 3, Item 3) onto hose (Figure 3, Item 4), and connect hose (Figure 3, Item 4) to fuel tank fitting (Figure 3, Item 1) and fuel filter (Figure 3, Item 10). Tighten two hose clamps (Figure 3, Item 3).
4. Remove caps/plugs, install two hose clamps (Figure 3, Item 6) onto hose (Figure 3, Item 7), and connect hose (Figure 3, Item 7) to fuel tank fitting (Figure 3, Item 5) and fuel filter (Figure 3, Item 10). Tighten two hose clamps (Figure 3, Item 6).
5. Remove caps/plugs, install two hose clamps (Figure 3, Item 11) onto hose (Figure 3, Item 12), and connect hose (Figure 3, Item 12) to injection pump (Figure 3, Item 13) and fuel filter (Figure 3, Item 10). Tighten two hose clamps (Figure 3, Item 11).

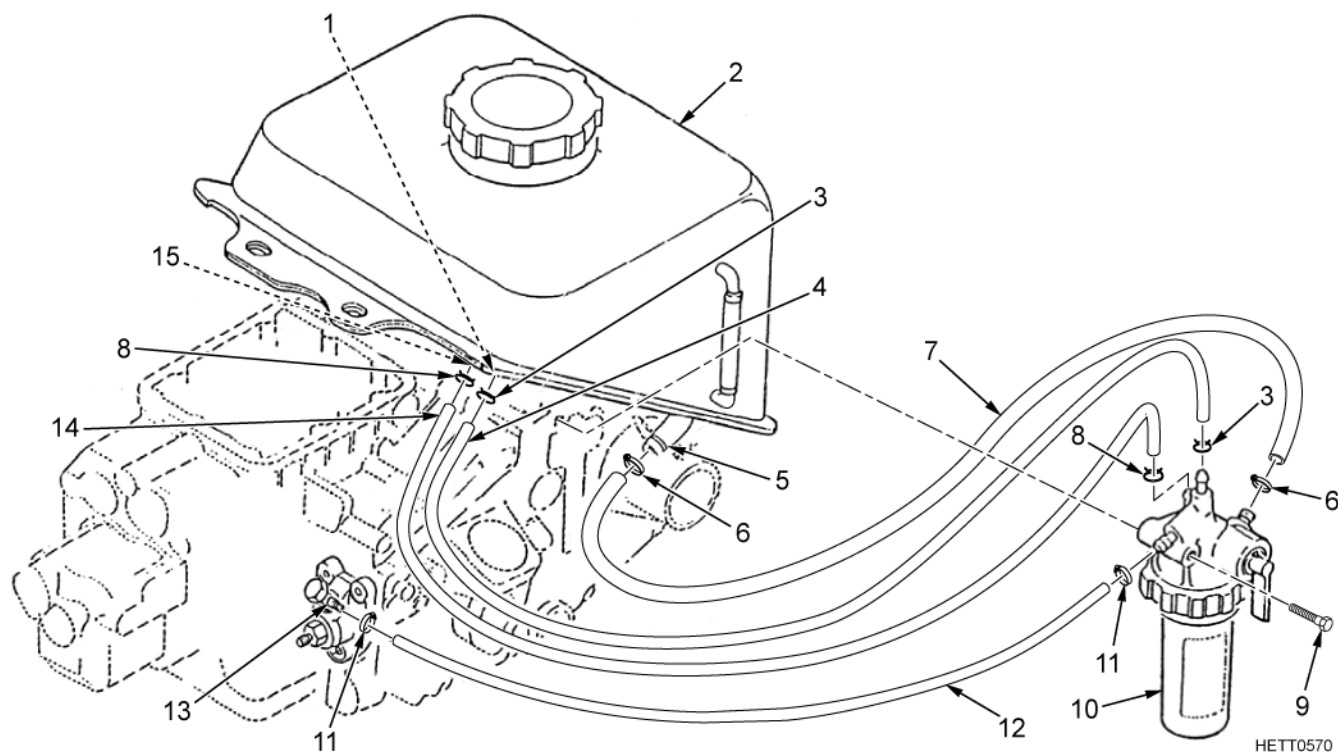


Figure 3. Fuel Filter Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Fill fuel tank with diesel fuel (WP 0136).

END OF WORK PACKAGE

FIELD MAINTENANCE
ENGINE PRIMING SYSTEM

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (SATS) (WP 0168, Item 28)

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)

Personnel Required

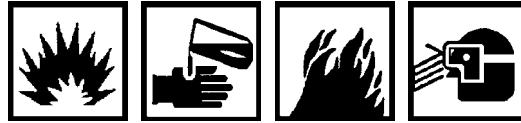
1

Equipment Conditions

Fuel tank drained (WP 0136)
Throttle cable removed (WP 0139)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the engine priming system.

REMOVAL**WARNING**

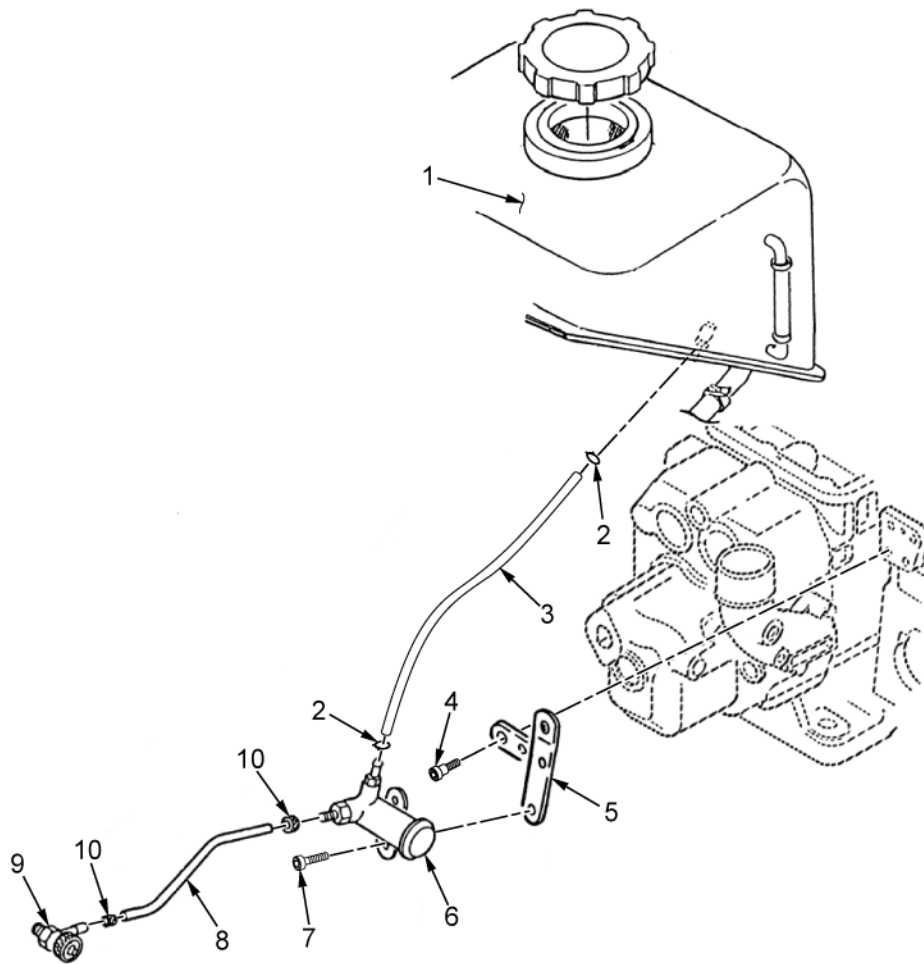
- Diesel fuel is combustible and is an irritant to the eyes, skin, and respiratory system. To avoid injury to personnel and explosion, extinguish all smoking materials and **DO NOT** allow sparks or open flame near the fuel tank or the fuel system. Use skin and eye protection and work in a well-ventilated area.
- Clean up any fuel that is spilled during fuel line removal or injury to personnel may result.

Failure to follow these warnings may result in injury or death to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or other foreign material from entering the fuel system or damage to equipment may result.

1. Loosen two hose clamps (Figure 1, Item 2) and remove hose (Figure 1, Item 3) from fuel tank (Figure 1, Item 1) and starting aid (Figure 1, Item 6). Collect excess fuel in hose in drain pan. Remove two hose clamps (Figure 1, Item 2) and cap/plug hose (Figure 1, Item 3).
2. Loosen and slide two coupling nuts (Figure 1, Item 10) up hose (Figure 1, Item 8) and remove hose with coupling nuts. Collect excess fuel in hose (Figure 1, Item 8) in drain pan. Remove flow valve (Figure 1, Item 9) and cap/plug hose (Figure 1, Item 8).
3. Remove two bolts (Figure 1, Item 7) and starting aid (Figure 1, Item 6) from bracket (Figure 1, Item 5).
4. Remove two bolts (Figure 1, Item 4) and bracket (Figure 1, Item 5) from engine.



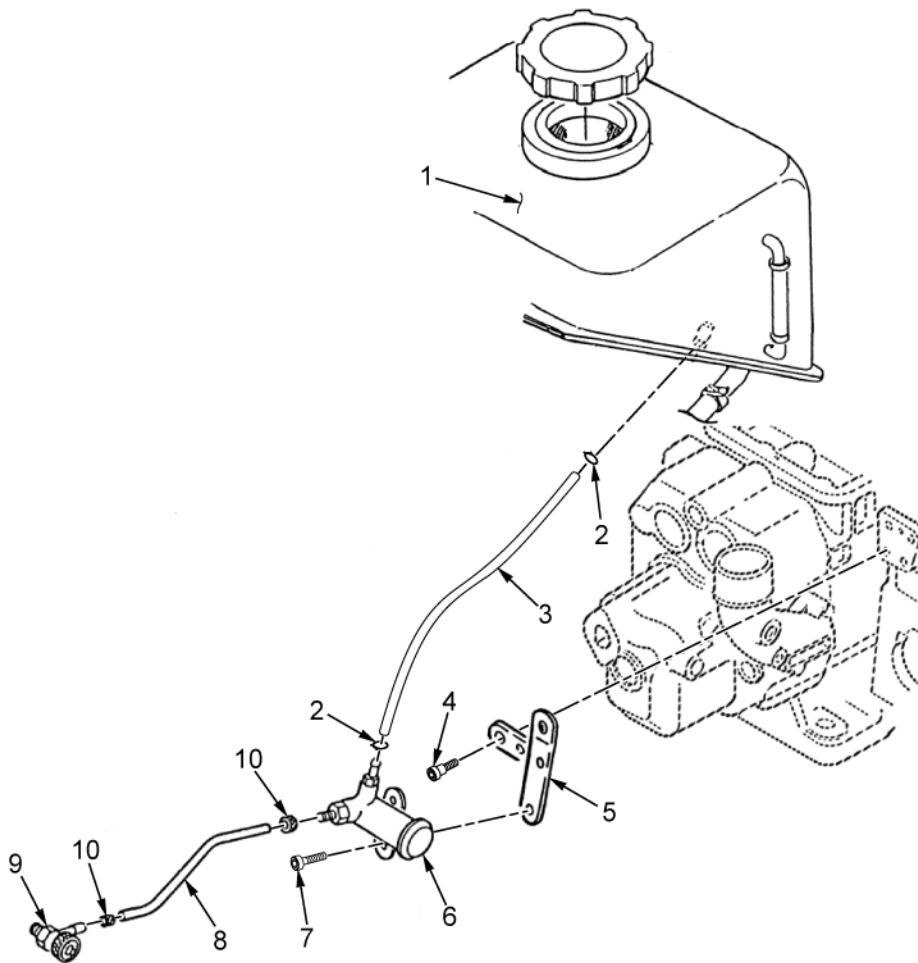
HETT0573

Figure 1. Engine Priming System Removal.

END OF TASK

INSTALLATION

1. Install bracket (Figure 2, Item 5) and two bolts (Figure 2, Item 4) on engine.
2. Install starting aid (Figure 2, Item 6) on bracket (Figure 2, Item 5) with two bolts (Figure 2, Item 7).
3. Install flow valve (Figure 2, Item 9).
4. Remove caps/plugs from hose (Figure 2, Item 8). Position two coupling nuts (Figure 2, Item 10) on hose (Figure 2, Item 8) and install hose onto flow valve (Figure 2, Item 9) and starting aid (Figure 2, Item 6). Tighten two coupling nuts (Figure 2, Item 10).
5. Remove caps/plugs from hose (Figure 2, Item 3). Install two hose clamps (Figure 2, Item 2) onto hose (Figure 2, Item 3) and install hose onto fuel tank (Figure 2, Item 1) and starting aid (Figure 2, Item 6). Secure hose (Figure 2, Item 3) with two hose clamps (Figure 2, Item 2).



HETT0573

Figure 2. Engine Priming System Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Install throttle cable (WP 0139).

Fill fuel tank with diesel fuel (WP 0136).

END OF WORK PACKAGE

FIELD MAINTENANCE

MECHANICAL THROTTLE CONTROL

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (WP 0168, Item 11)

Personnel Required

1

Equipment Conditions

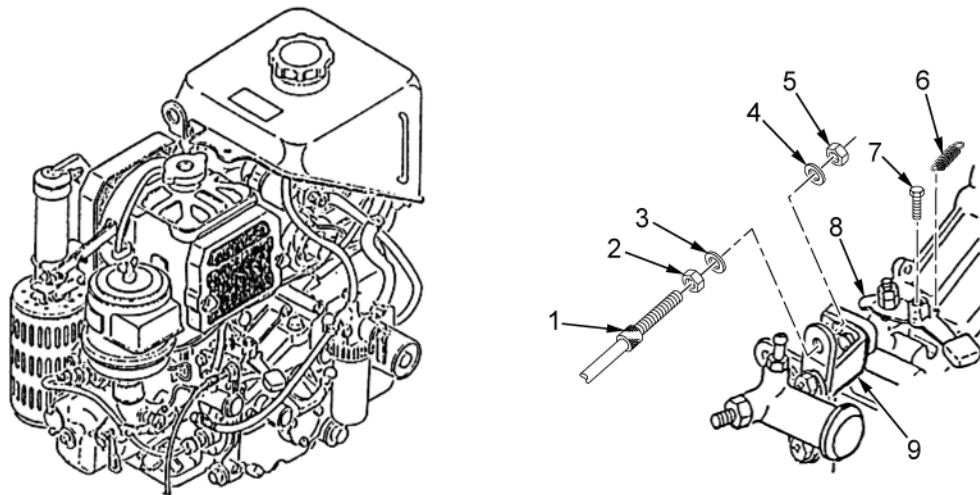
Step assembly raised (WP 0005)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the mechanical throttle control.

REMOVAL

1. Remove spring (Figure 1, Item 6) from control lever (Figure 1, Item 8).
2. Loosen bolt (Figure 1, Item 7) and disconnect throttle cable (Figure 1, Item 1) from control lever (Figure 1, Item 8).
3. Remove nut (Figure 1, Item 5) and washer (Figure 1, Item 4) from throttle cable (Figure 1, Item 1).
4. Pull throttle cable (Figure 1, Item 1) from bracket (Figure 1, Item 9). Remove washer (Figure 1, Item 3) and nut (Figure 1, Item 2) from throttle cable (Figure 1, Item 1).



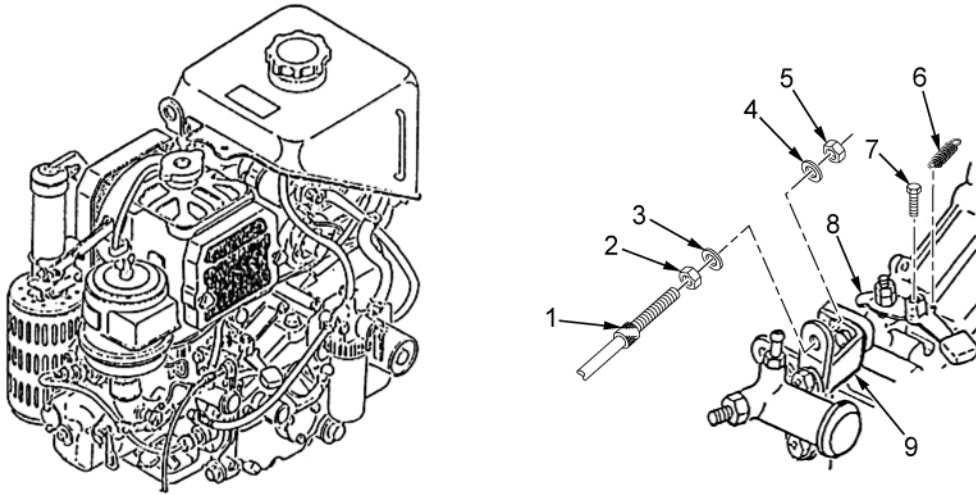
HETT0574

Figure 1. Mechanical Throttle Control Removal.

END OF TASK

INSTALLATION

1. Install nut (Figure 2, Item 2) and washer (Figure 2, Item 3) on throttle cable (Figure 2, Item 1).
2. Push throttle cable (Figure 2, Item 1) through bracket (Figure 2, Item 9) and install washer (Figure 2, Item 4) and nut (Figure 2, Item 5) on throttle cable.
3. Insert throttle cable (Figure 2, Item 1) in control lever (Figure 2, Item 8) and tighten bolt (Figure 2, Item 7).
4. Install spring (Figure 2, Item 6) on control lever.



HETT0574

Figure 2. Mechanical Throttle Control Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Lower step assembly (APU Startup and Shutdown) (WP 0005).

END OF WORK PACKAGE

FIELD MAINTENANCE**APU CONTROL BOX**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (SATS) (WP 0168, Item 28)

Lockwasher (1) (TM 9-2330-381-24P)
Lockwasher (1) (TM 9-2330-381-24P)
Rubber Seal (1) (TM 9-2330-381-24P)

Materials/Parts

Locknut (3) (TM 9-2330-381-24P)
Lockwasher (2) (TM 9-2330-381-24P)
Lockwasher (2) (TM 9-2330-381-24P)
Lockwasher (4) (TM 9-2330-381-24P)
Lockwasher (1) (TM 9-2330-381-24P)

Personnel Required

1

Equipment Conditions

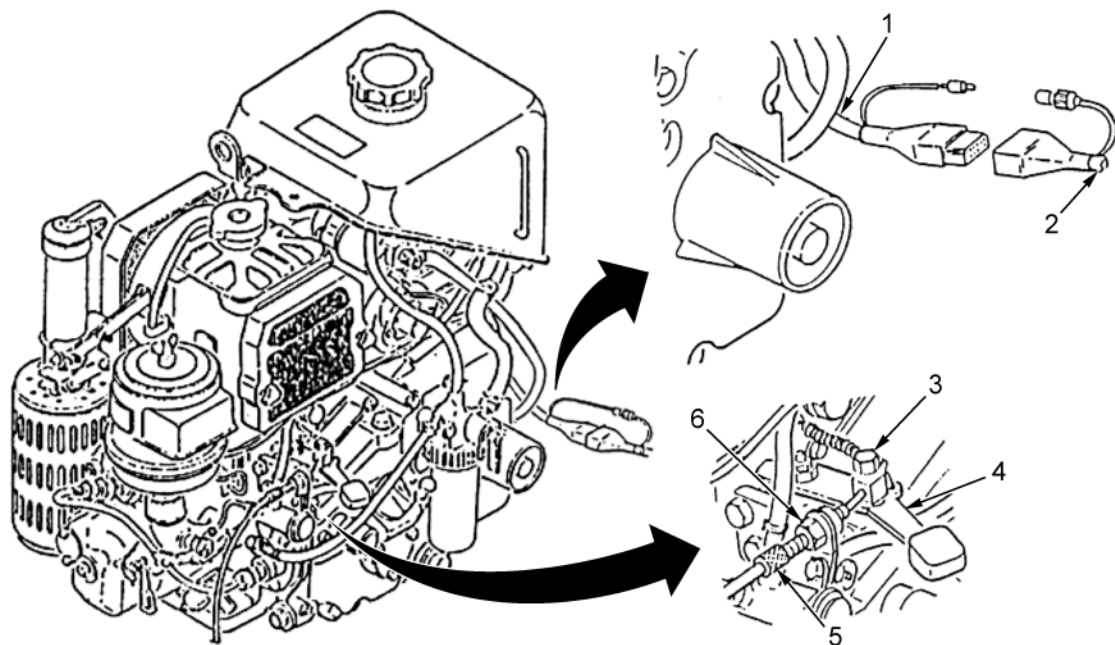
Step assembly raised (WP 0005)

GENERAL INFORMATION

This work package contains instructions for the removal, repair, and installation of the Auxiliary Power Unit (APU).

REMOVAL

1. Loosen bolt (Figure 1, Item 3) and disconnect throttle cable (Figure 1, Item 5) from speed control lever (Figure 1, Item 4). Loosen throttle cable adjustment nut (Figure 1, Item 6).
2. Tag and disconnect APU cable assembly (Figure 1, Item 2) from APU wiring harness (Figure 1, Item 1).



HETT0575

Figure 1. APU Control Box.

3. Remove three locknuts (Figure 2, Item 4), clamp (Figure 2, Item 3), and APU cable assembly (Figure 2, Item 2) from gooseneck assembly (Figure 2, Item 1). Discard locknuts.
4. Remove locknut (Figure 2, Item 10), clamp (Figure 2, Item 11), and throttle cable (Figure 2, Item 9) from gooseneck assembly (Figure 2, Item 1). Discard locknut.
5. Remove two capscrews (Figure 2, Item 8), lockwashers (Figure 2, Item 7), washers (Figure 2, Item 6), and control box (Figure 2, Item 5) from gooseneck assembly. Discard lockwashers.

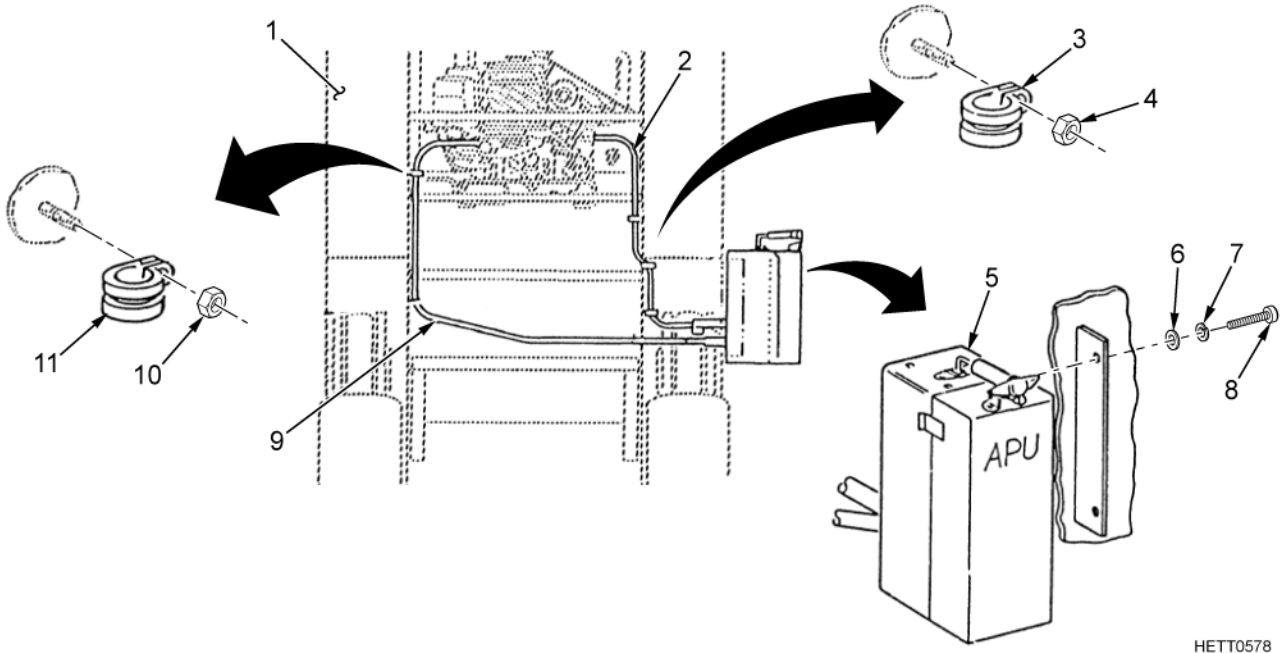
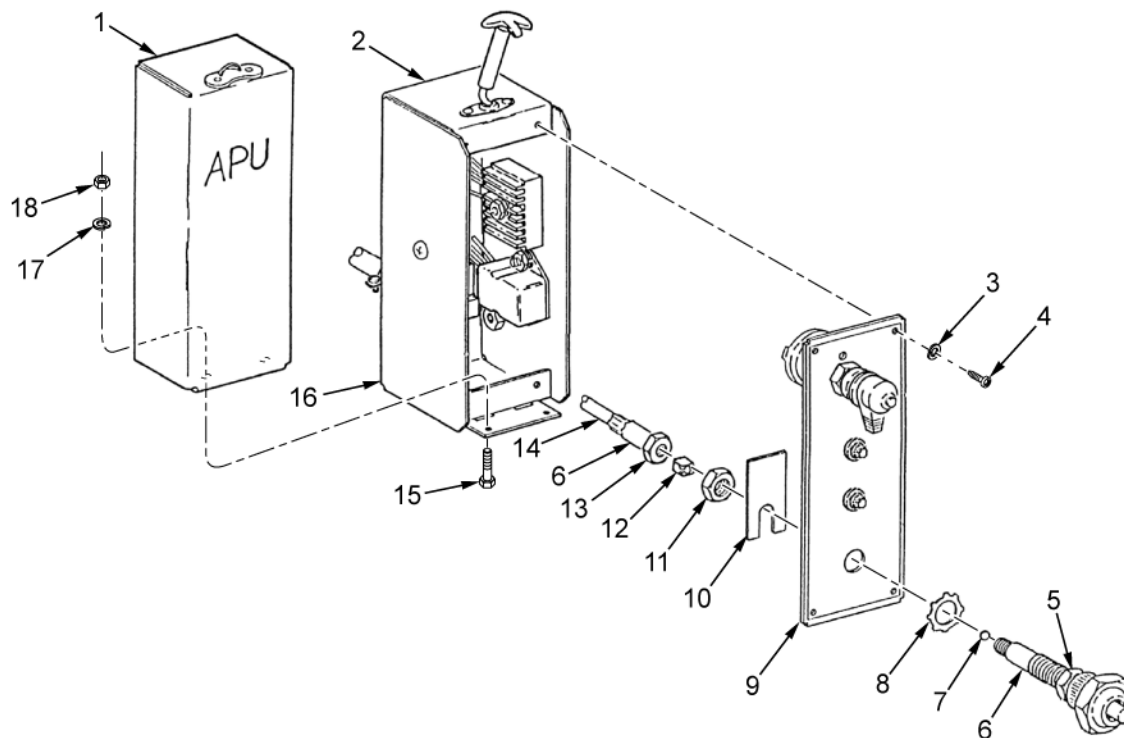


Figure 2. APU Control Box.

END OF TASK

REPAIR

1. Lift clamp assembly (Figure 3, Item 2), open cover (Figure 3, Item 1), and remove two nuts (Figure 3, Item 18), lockwashers (Figure 3, Item 17), screws (Figure 3, Item 15), and cover from housing (Figure 3, Item 16). Discard lockwashers.
2. Remove four thread-cutting screws (Figure 3, Item 4) and lockwashers (Figure 3, Item 3) and plate (Figure 3, Item 9) from housing (Figure 3, Item 16). Discard lockwashers.
3. Remove push-pull throttle control assembly (Figure 3, Item 6) as follows:
 - a. Loosen nut (Figure 3, Item 13) on push-pull control assembly (Figure 3, Item 6) sufficiently to separate and disconnect control assembly at ball (Figure 3, Item 7) and swivel (Figure 3, Item 12).
 - b. Remove nut (Figure 3, Item 11) and housing lock (Figure 3, Item 10). Pull front portion of push-pull control assembly (Figure 3, Item 6) from plate (Figure 3, Item 9). Retain lockwasher (Figure 3, Item 8) and nut (Figure 3, Item 5) on control assembly (Figure 3, Item 6).
 - c. Push back portion of control assembly (Figure 3, Item 6) and throttle cable (Figure 3, Item 14) out through opening in rear of housing (Figure 3, Item 16).



HETT0577

Figure 3. APU Control Box.

4. Tag and disconnect APU cable assembly (Figure 4, Item 11) from rectifier (Figure 4, Item 1) and regulator (Figure 4, Item 8).
5. Remove indicator light(s) (Figure 4, Item 6) and glow plug indicator (Figure 4, Item 7), if applicable (WP 0052).
6. Tag and disconnect APU cable assembly (Figure 4, Item 11) from rotary switch (Figure 4, Item 5).
7. Remove two screws (Figure 4, Item 15) and clamp half (Figure 4, Item 14). Unscrew and remove jam nut (Figure 4, Item 12) and bulkhead cable clamp (Figure 4, Item 13).
8. Remove two nuts (Figure 4, Item 10), lockwashers (Figure 4, Item 9), washers (Figure 4, Item 3), screws (Figure 4, Item 4), and regulator (Figure 4, Item 8) from housing (Figure 4, Item 19). Discard lockwashers.
9. Remove nut (Figure 4, Item 16), lockwasher (Figure 4, Item 17), washer (Figure 4, Item 18), screw (Figure 4, Item 2), and rectifier (Figure 1, Item 1). Discard lockwasher.

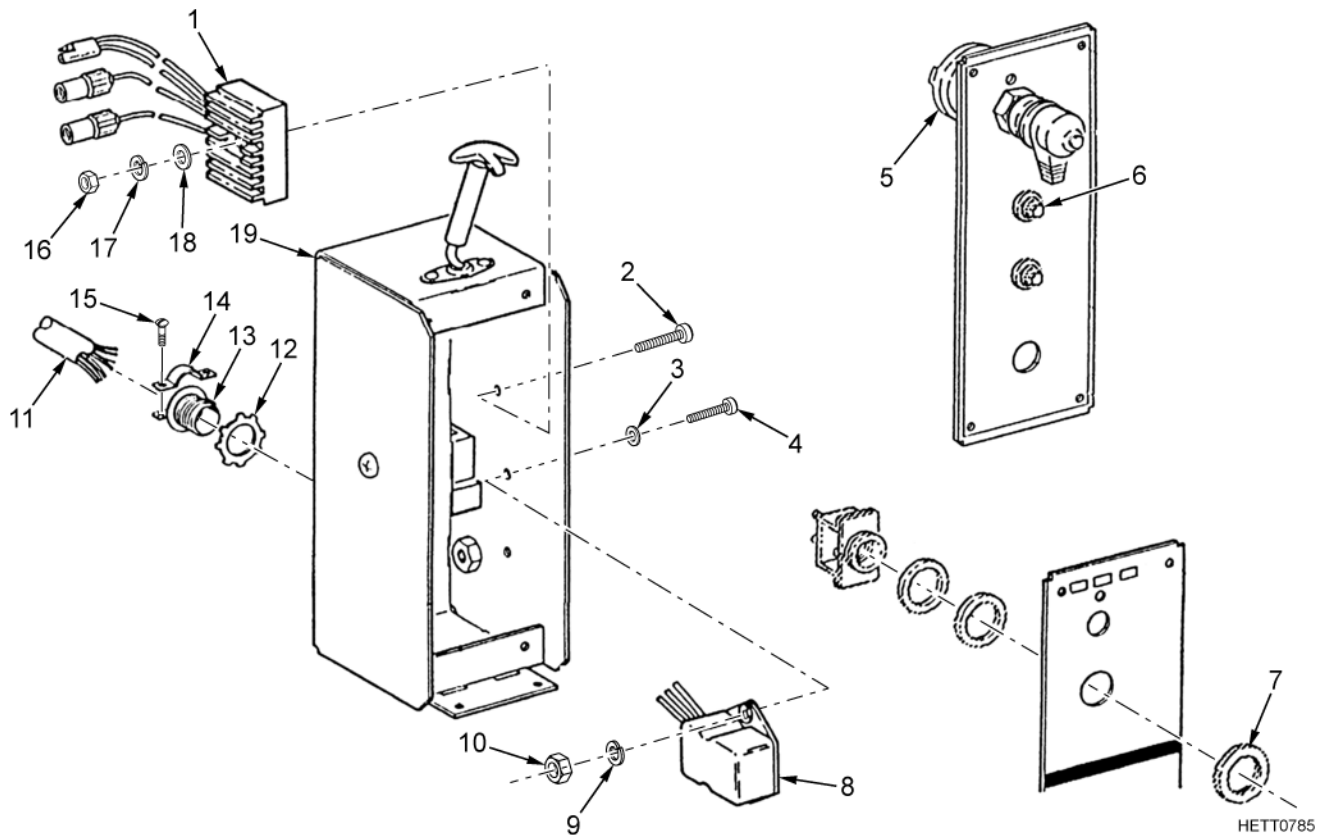


Figure 4. APU Control Box.

NOTE

Two-position connectors on rectifier and APU cable assembly must be a perfect match if replaced.

10. Replace two-position connectors as required (WP 0064).
11. Remove control box jumper wires and timer harness (APU Control Box Jumper Wires and Timer Harness [WP 0056]).
12. If applicable, remove nut (Figure 5, Item 4), lockwasher (Figure 5, Item 3), washer (Figure 5, Item 2), screw (Figure 5, Item 12), and glow plug timer (Figure 5, Item 1) from housing (Figure 5, Item 13).
13. Remove setscrew (Figure 5, Item 10), knob (Figure 5, Item 9), rubber seal (Figure 5, Item 8), washer (Figure 5, Item 7), nut (Figure 5, Item 6), and rotary switch (Figure 5, Item 5) from plate (Figure 5, Item 11). Discard rubber seal.

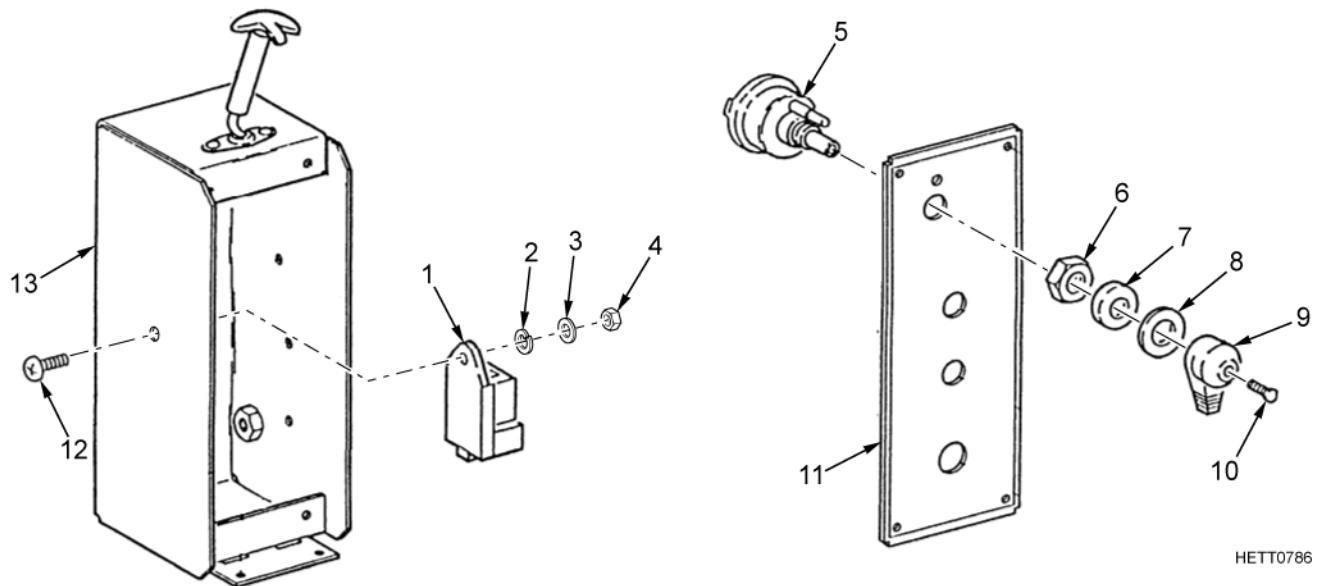
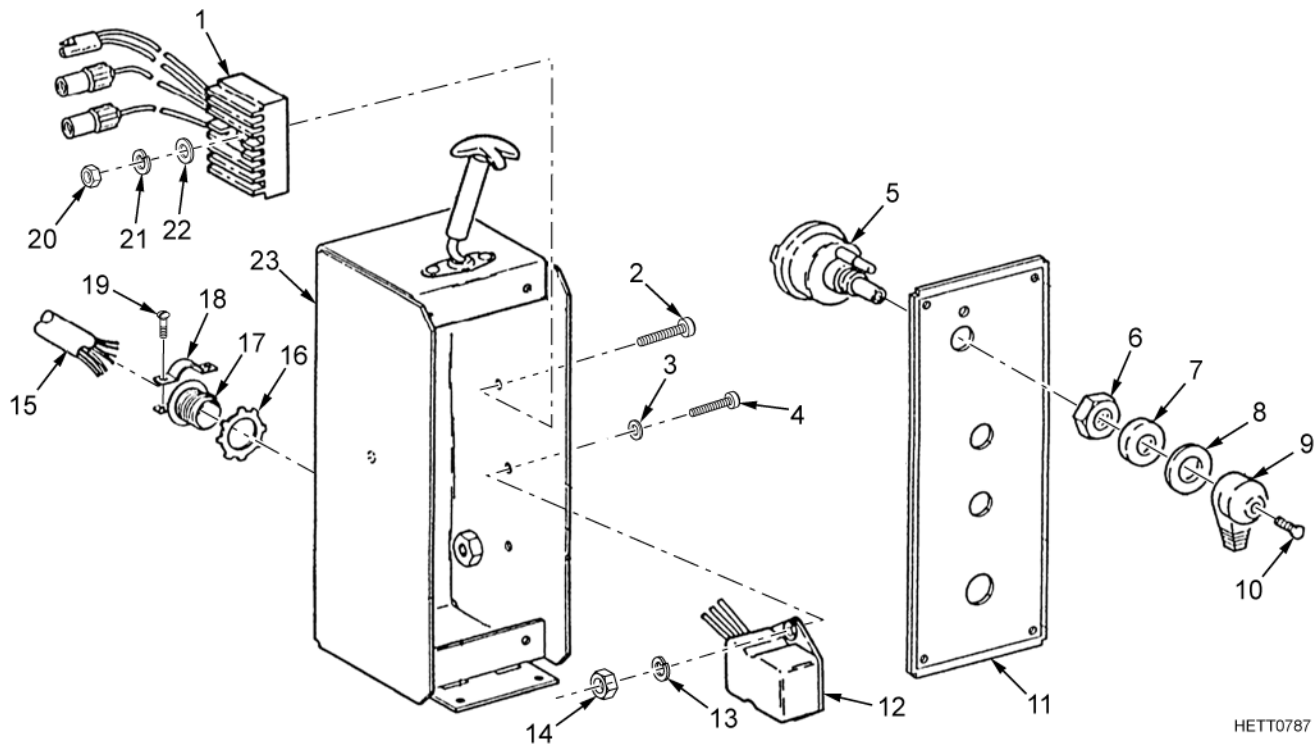


Figure 5. APU Control Box.

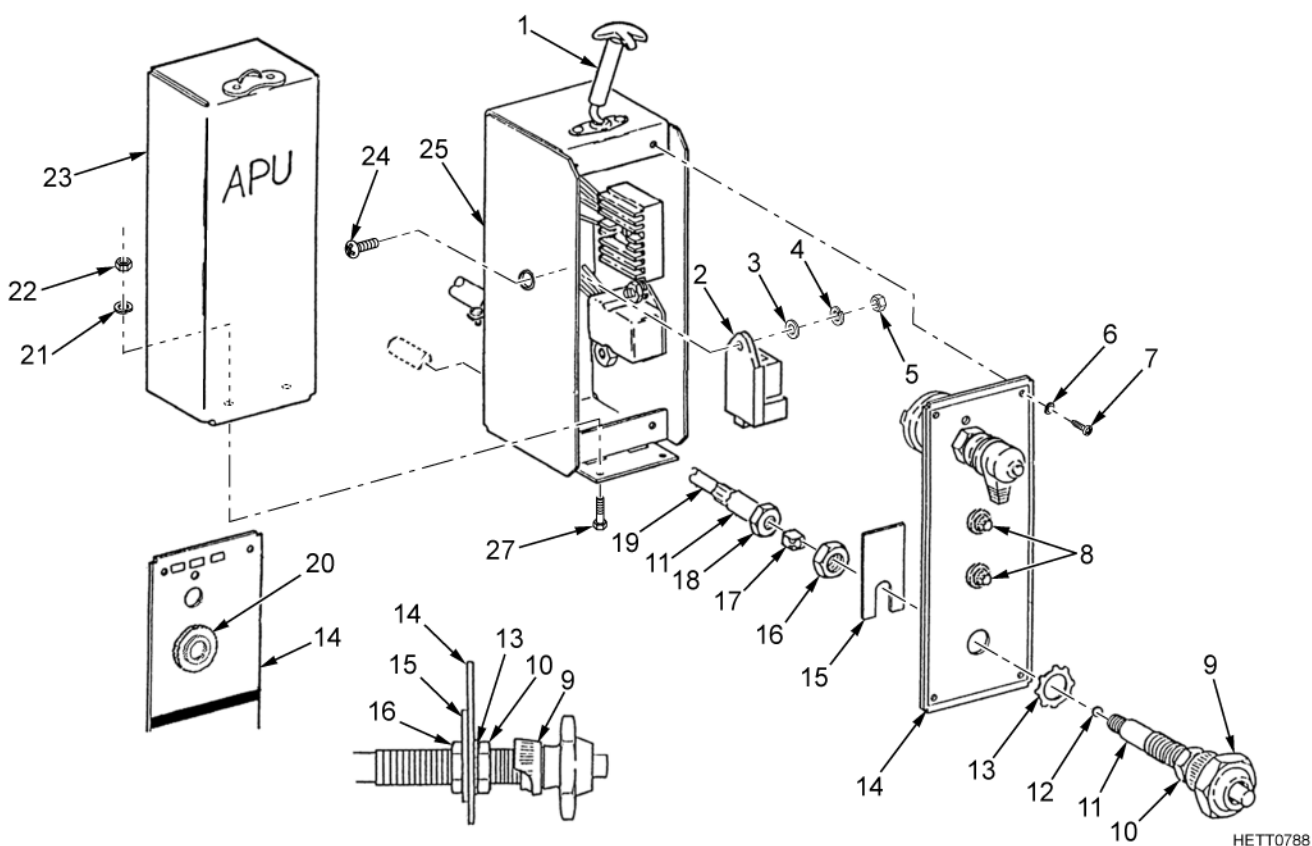
14. Install rotary switch (Figure 6, Item 5) onto plate (Figure 6, Item 11) and secure with nut (Figure 6, Item 6).
15. Install rubber washer (Figure 6, Item 7), seal (Figure 6, Item 8), knob (Figure 6, Item 9), and setscrew (Figure 6, Item 10).
16. Install rectifier (Figure 6, Item 1) with screw (Figure 6, Item 2), washer (Figure 6, Item 22), lockwasher (Figure 6, Item 21), and nut (Figure 6, Item 20) onto housing (Figure 6, Item 23).
17. Install regulator (Figure 6, Item 12) with two screws (Figure 6, Item 4), washers (Figure 6, Item 3), lockwashers (Figure 6, Item 13), and nuts (Figure 6, Item 14) onto housing (Figure 6, Item 23).
18. Install bulkhead cable clamp (Figure 6, Item 17), with APU cable assembly (Figure 6, Item 15) attached, onto housing (Figure 6, Item 23) and secure with jam nut (Figure 6, Item 16). Install clamp half (Figure 6, Item 18) and two screws (Figure 6, Item 19) onto cable clamp.
19. Connect APU cable assembly (Figure 6, Item 15) to rotary switch (Figure 6, Item 5).
20. Connect APU cable assembly (Figure 6, Item 15) to rectifier (Figure 6, Item 1) and regulator (Figure 6, Item 12).



HETT0787

Figure 6. APU Control Box.

21. Install indicator light(s) (Figure 7, Item 8) and glow plug indicator (Figure 7, Item 20), if applicable (WP 0064).
22. If applicable, install glow plug timer (Figure 7, Item 2) and secure using screw (Figure 7, Item 24), washer (Figure 7, Item 3), lockwasher (Figure 7, Item 4), and nut (Figure 7, Item 5).
23. Install control box jumper wires and timer harness (WP 0056).
24. Install push-pull throttle control assembly (Figure 7, Item 11) as follows:
 - a. Unscrew knurled nut (Figure 7, Item 9) on control assembly (Figure 7, Item 11) until threaded end of control assembly is accessible.
 - b. Insert control assembly (Figure 7, Item 11) through locknut (Figure 7, Item 13) and through mounting hole on panel (Figure 7, Item 14) and adjust nut (Figure 7, Item 10) until distance between edge of nut and end of control assembly shaft measures between 0.31 to 0.38 in. (7.8 to 9.5 mm).
 - c. Install housing lock (Figure 7, Item 15) and nut (Figure 7, Item 16) from rear of panel (Figure 7, Item 14) to secure front portion of control assembly (Figure 7, Item 11). Secure in place with jam nut (Figure 7, Item 13).
 - d. Screw knurled nut (Figure 7, Item 9) back onto control assembly (Figure 7, Item 11).
 - e. Pass back portion of control assembly (Figure 7, Item 11) with throttle cable (Figure 7, Item 19) through housing (Figure 7, Item 25) and connect to front portion of control assembly at ball (Figure 7, Item 12) and swivel (Figure 7, Item 17). Secure connection by tightening nut (Figure 7, Item 18) on control assembly.
25. Install panel (Figure 7, Item 14) onto housing (Figure 7, Item 25) and secure with four lockwashers (Figure 7, Item 6) and four thread-cutting screws (Figure 7, Item 7).
26. Install cover (Figure 7, Item 23) onto housing (Figure 7, Item 25) and secure with two screws (Figure 7, Item 27), lockwashers (Figure 7, Item 21), and nuts (Figure 7, Item 22). Lift clamp assembly (Figure 7, Item 1) and close cover (Figure 7, Item 23).



HETT0788

Figure 7. APU Control Box.

END OF TASK

INSTALLATION

1. Install control box (Figure 8, Item 5) onto gooseneck assembly (Figure 8, Item 1) and secure with two washers (Figure 8, Item 6), lockwashers (Figure 8, Item 7), and capscrews (Figure 8, Item 8).
2. Install throttle cable (Figure 8, Item 9) onto gooseneck assembly (Figure 8, Item 1) and secure with two clamps (Figure 8, Item 11) and locknuts (Figure 8, Item 10).
3. Install APU cable assembly (Figure 8, Item 2) onto gooseneck assembly (Figure 8, Item 1) and secure with three clamps (Figure 8, Item 3) and locknuts (Figure 8, Item 4).

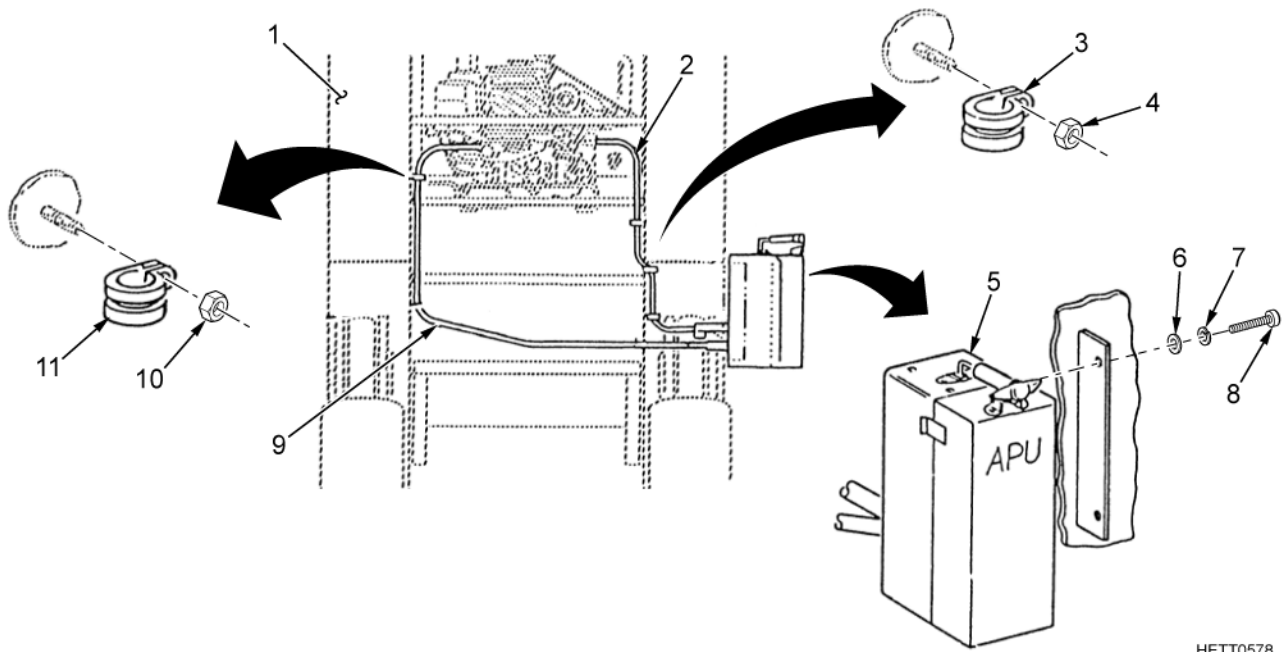
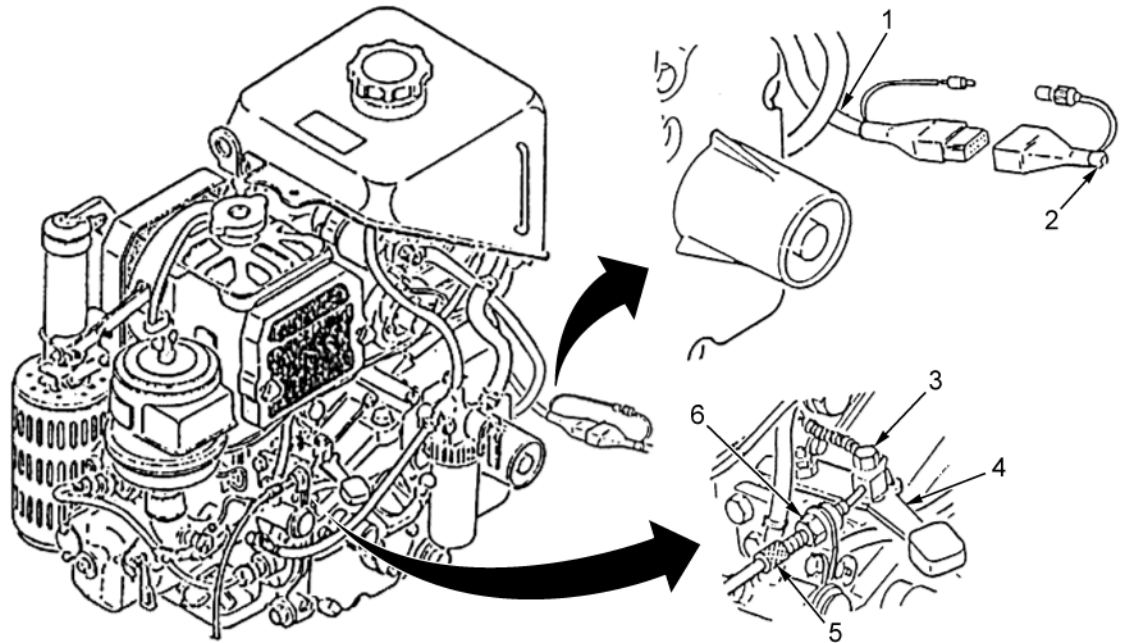


Figure 8. APU Control Box.

4. Connect APU cable assembly (Figure 9, Item 2) to APU wiring harness (Figure 9, Item 1).
5. Connect throttle cable (Figure 9, Item 5) to speed control lever (Figure 9, Item 4). Adjust throttle cable adjustment nut (Figure 9, Item 6) and tighten bolt (Figure 9, Item 3).



HETT0575

Figure 9. APU Control Box.

END OF TASK**FOLLOW-ON MAINTENANCE**

Start and run APU (WP 0005).

Lower step assembly (WP 0005).

END OF WORK PACKAGE

FIELD MAINTENANCE**ENGINE EXHAUST**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (SATS) (WP 0168, Item 28)

Gasket (1) (TM 9-2330-381-24P)

Personnel Required

1

Materials/Parts

Lockwasher (1) (TM 9-2330-381-24P)
Locknut (3) (TM 9-2330-381-24P)

Equipment Conditions

Step assembly raised (WP 0005)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the engine exhaust.

REMOVAL**WARNING**

Ensure APU is cool and exhaust pipe is cool to the touch. Failure to follow this warning may result in injury or death to personnel.

1. Remove cap (Figure 1, Item 2) from exhaust pipe (Figure 1, Item 12).
2. Remove screw (Figure 1, Item 6) and lockwasher (Figure 1, Item 5) from bracket (Figure 1, Item 4). Discard lockwasher.
3. Remove two nuts (Figure 1, Item 14), U-bolt (Figure 1, Item 1), clamp (Figure 1, Item 3), and bracket (Figure 1, Item 4) from exhaust pipe (Figure 1, Item 12).
4. Remove two nuts (Figure 1, Item 10), U-bolt (Figure 1, Item 13), clamp (Figure 1, Item 11), and exhaust pipe (Figure 1, Item 12) from muffler (Figure 1, Item 15).
5. Remove three locknuts (Figure 1, Item 9), muffler (Figure 1, Item 15), and gasket (Figure 1, Item 7). Discard locknuts and gasket.
6. If necessary, remove three studs (Figure 1, Item 8) from muffler.

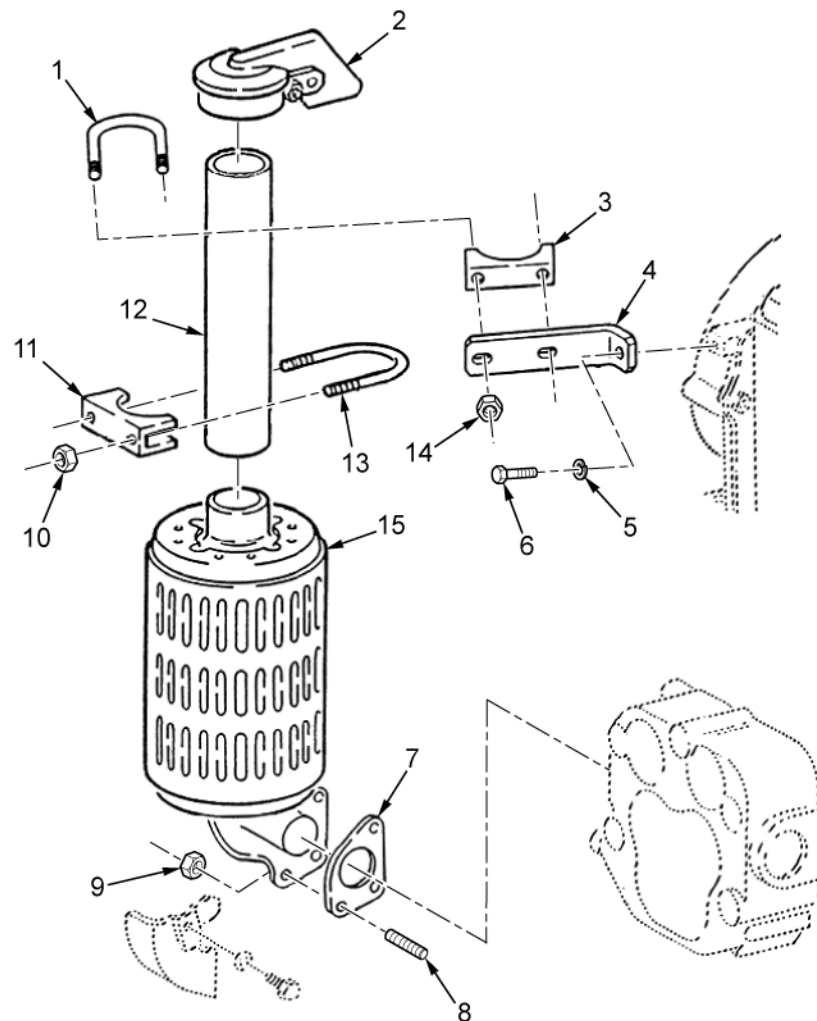


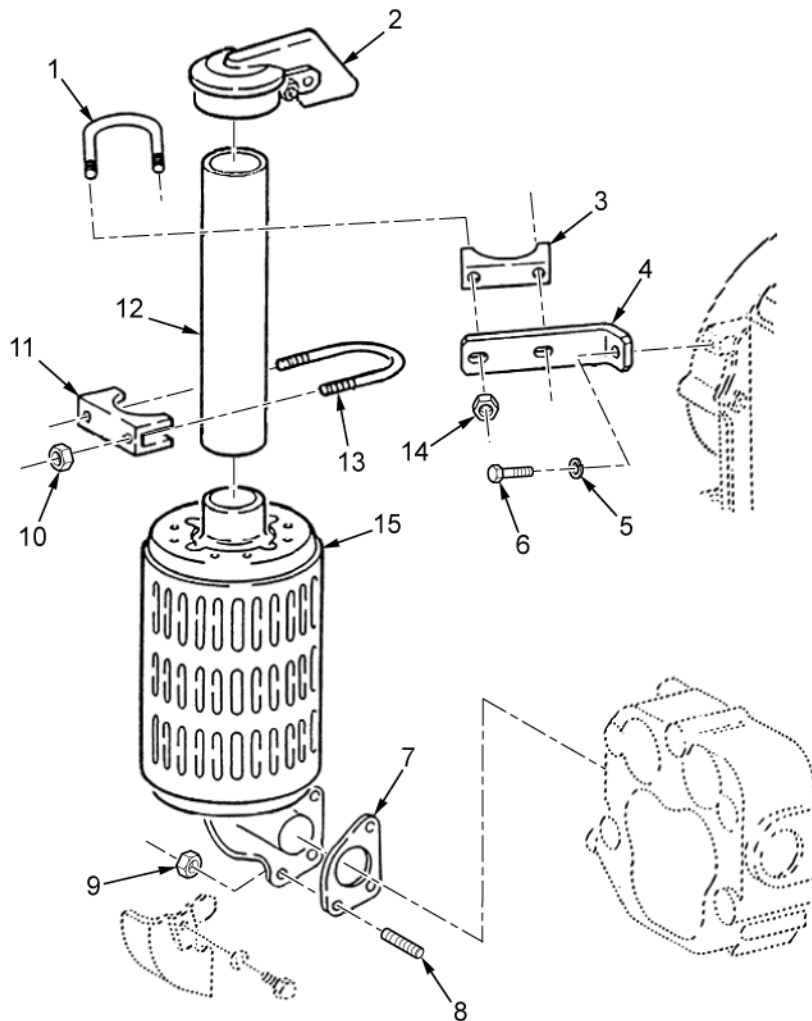
Figure 1. Engine Exhaust.

HETT0580

END OF TASK

INSTALLATION

1. If removed, install three studs (Figure 2, Item 8) on muffler (Figure 2, Item 15).
2. Install muffler (Figure 2, Item 15) and three locknuts (Figure 2, Item 9). Torque locknuts (Figure 2, Item 9) to 17. 4 to 20.3 lb-ft (23.5 to 27.5 Nm).
3. Install exhaust pipe (Figure 2, Item 12), clamp (Figure 2, Item 11), U-bolt (Figure 2, Item 13), and two nuts (Figure 2, Item 10) on muffler (Figure 2, Item 15).
4. Install clamp (Figure 2, Item 3), U-bolt (Figure 2, Item 1), bracket (Figure 2, Item 4), and two nuts (Figure 2, Item 14) on exhaust pipe (Figure 2, Item 12).
5. Install gasket (Figure 2, Item 7) on muffler, steel side toward muffler (Figure 2, Item 15).
6. Install lockwasher (Figure 2, Item 5) and screw (Figure 2, Item 6) on bracket (Figure 2, Item 4).
7. Install cap (Figure 2, Item 2) on exhaust pipe (Figure 2, Item 12).



HETT0580

Figure 2. Engine Exhaust.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**RADIATOR**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (SATS) (WP 0168, Item 28)

Gasket (1) (TM 9-2330-381-24P)
Lockwasher (4) (TM 9-2330-381-24P)

Personnel Required

1

Materials/Parts

Antifreeze (WP 0170, Item 2)
Sealant (WP 0170, Item 24)
Sealing Compound Thread Locking (WP 0170, Item 25)
Gasket (1) (TM 9-2330-381-24P)

Equipment Conditions

Fan vanaxial removed (WP 0144)

GENERAL INFORMATION

This work package contains instructions for the removal, repair, and installation of the radiator.

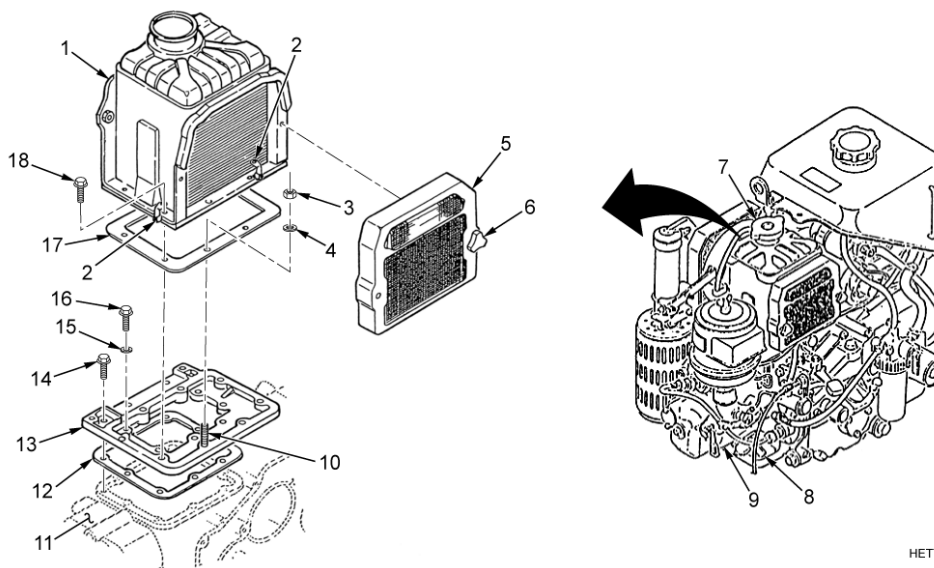
REMOVAL

WARNING

- Ethylene glycol is toxic to skin, eyes, and respiratory tract. Avoid skin and eye contact. Good general ventilation is normally adequate.
- When hot, radiator temperature may exceed 210°F (100°C) and maintain pressure up to 16 psi (108 kPa). **DO NOT** open radiator while hot or injury to personnel may result.

Failure to follow these warnings may result in severe injury or death to personnel.

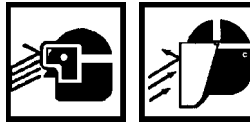
1. Place drain pan under radiator (Figure 1, Item 1) and drain radiator by removing radiator cap (Figure 1, Item 7) and opening drain cock (Figure 1, Item 8) on cylinder head (Figure 1, Item 9).
2. Loosen two captive thumbscrews (Figure 1, Item 6) and remove shroud (Figure 1, Item 5) from radiator (Figure 1, Item 1).
3. Remove three nuts (Figure 1, Item 3), lockwashers (Figure 1, Item 4), and retaining strap (Figure 1, Item 2) from three studs (Figure 1, Item 10). Discard lockwashers.
4. Remove four bolts (Figure 1, Item 18), radiator (Figure 1, Item 1), and gasket (Figure 1, Item 17). Discard gasket.
5. Remove four bolts (Figure 1, Item 14), eight bolts (Figure 1, Item 16), washers (Figure 1, Item 15), radiator base plate (Figure 1, Item 13), and gasket (Figure 1, Item 12) from crankcase (Figure 1, Item 11). Discard gasket.
6. If necessary, remove three studs (Figure 1, Item 10) from radiator base plate (Figure 1, Item 13).



HETT0581

Figure 1. Radiator.

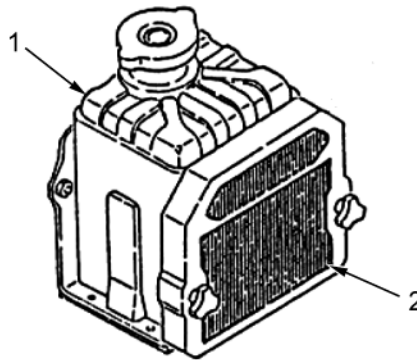
END OF TASK

REPAIR**WARNING**

To avoid eye or skin injury, DO NOT clean with compressed air in excess of 30 psi (207 kPa). Wear goggles or face shield.

Failure to follow this warning may result in injury to personnel.

1. Straighten radiator fins (Figure 2, Item 2) and clean radiator fins with compressed air.
2. If radiator (Figure 2, Item 1) is corroded, flush cooling system with hot water.



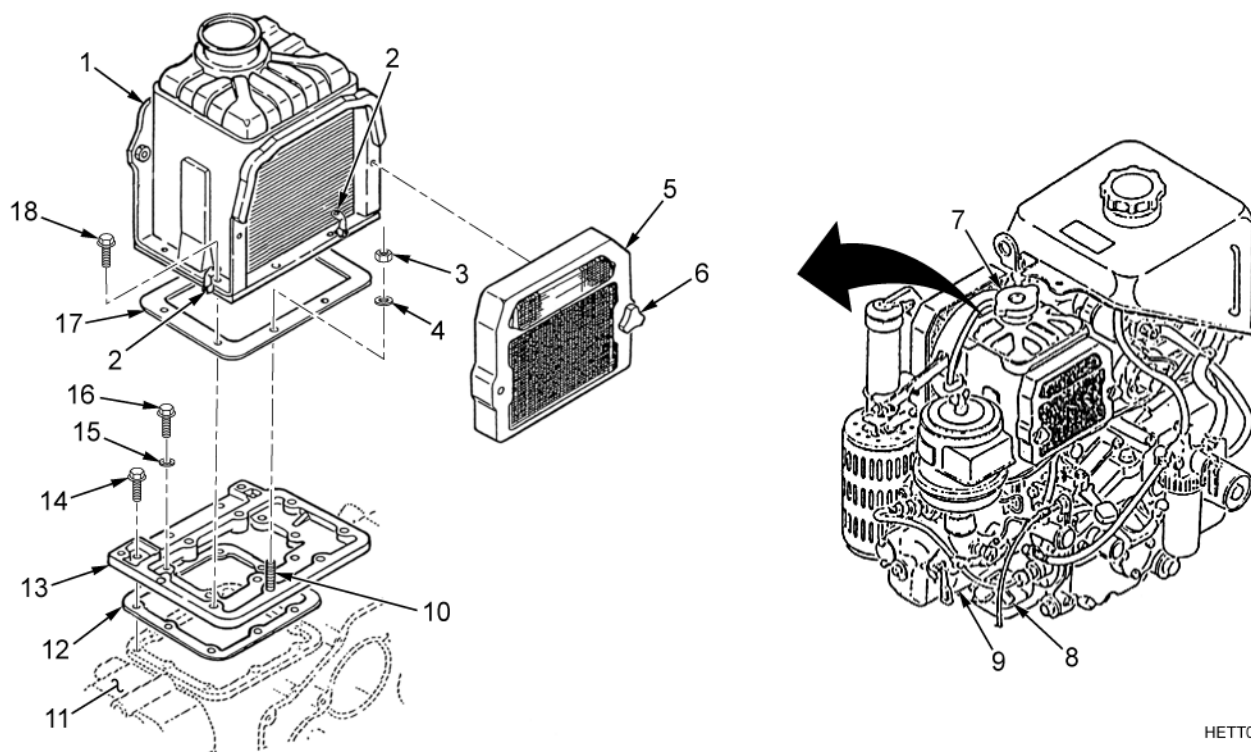
HETT0790

Figure 2. Radiator.

END OF TASK

INSTALLATION

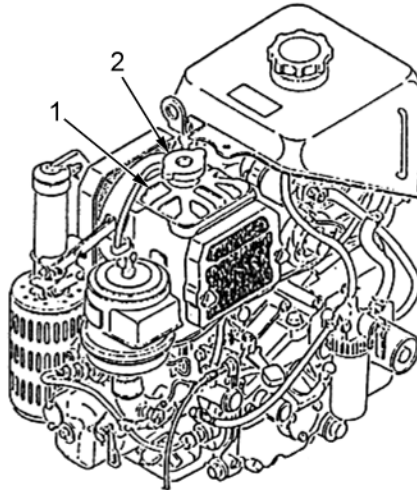
1. Apply thread locking compound to three studs (Figure 3, Item 10) and install three studs in radiator base plate (Figure 3, Item 13).
2. Apply sealant to both surfaces of gasket (Figure 3, Item 12). Install gasket and radiator base plate (Figure 3, Item 13), with six washers (Figure 3, Item 15), bolts (Figure 3, Item 16), and four bolts (Figure 3, Item 14) on crankcase (Figure 3, Item 11).
3. Apply sealant to both surfaces of gasket (Figure 3, Item 17) and install gasket, radiator (Figure 3, Item 1), retaining strap (Figure 3, Item 2), and four bolts (Figure 3, Item 18).
4. Install retaining strap (Figure 3, Item 2), three lockwashers (Figure 3, Item 4), and three nuts (Figure 3, Item 3) onto three studs (Figure 3, Item 10).
5. Install shroud (Figure 3, Item 5) and tighten two captive thumbscrews (Figure 3, Item 6).
6. Close drain cock (Figure 3, Item 8) on cylinder head (Figure 3, Item 9) and replace radiator cap (Figure 3, Item 7).



HETT0581

Figure 3. Radiator.

7. Remove radiator cap (Figure 4, Item 2).
8. Fill radiator (Figure 4, Item 1) with 1.3 quarts (1.2 l) of 70/30 mixture (70 percent antifreeze and 30 percent water).
9. Install radiator cap (Figure 4, Item 2).



HETT0791

Figure 4. Radiator.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**FAN BELT**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)

Personnel Required

2

Equipment Conditions

Starter removed (WP 0146)

APU wiring disconnected from fan vanaxial (WP 0064)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the fan belt.

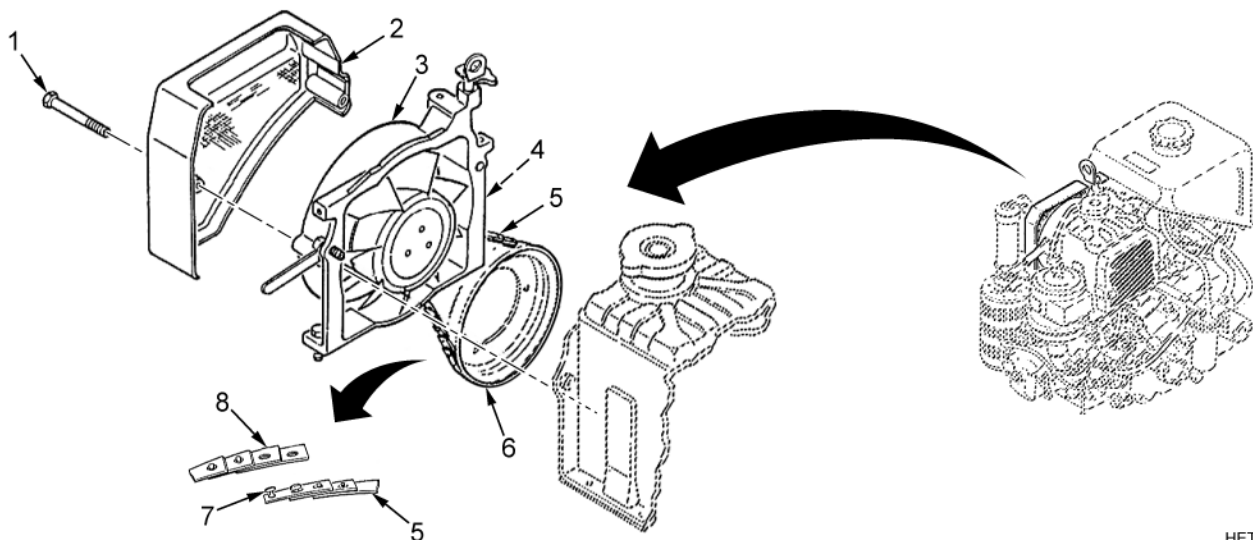
REMOVAL

1. Remove two bolts (Figure 1, Item 1) and fan cover (Figure 1, Item 2) from fan vanaxle (Figure 1, Item 3).

CAUTION

Use caution when removing fan belt so as not to lose or catch belt lock pins in the flywheel, or flywheel housing or damage to equipment and unnecessary work may result.

2. With aid of assistant and manual handcrank, slowly turn motor (Figure 1, Item 4) over while carefully prying belt (Figure 1, Item 5) off of fan pulley (Figure 1, Item 6) with screwdriver.
3. Turn two locking tabs (Figure 1, Item 7) 90 degrees so that tabs are parallel with belt (Figure 1, Item 5). Pry top layer of belt (Figure 1, Item 8) off of one locking tab (Figure 1, Item 7). Pry remaining belt layer off of two locking tabs.
4. Remove belt (Figure 1, Item 5).



HETT0582

Figure 1. Fan Belt.

END OF TASK

INSTALLATION

1. If belt has excessive play from previous inspections, readjust belt.

NOTE

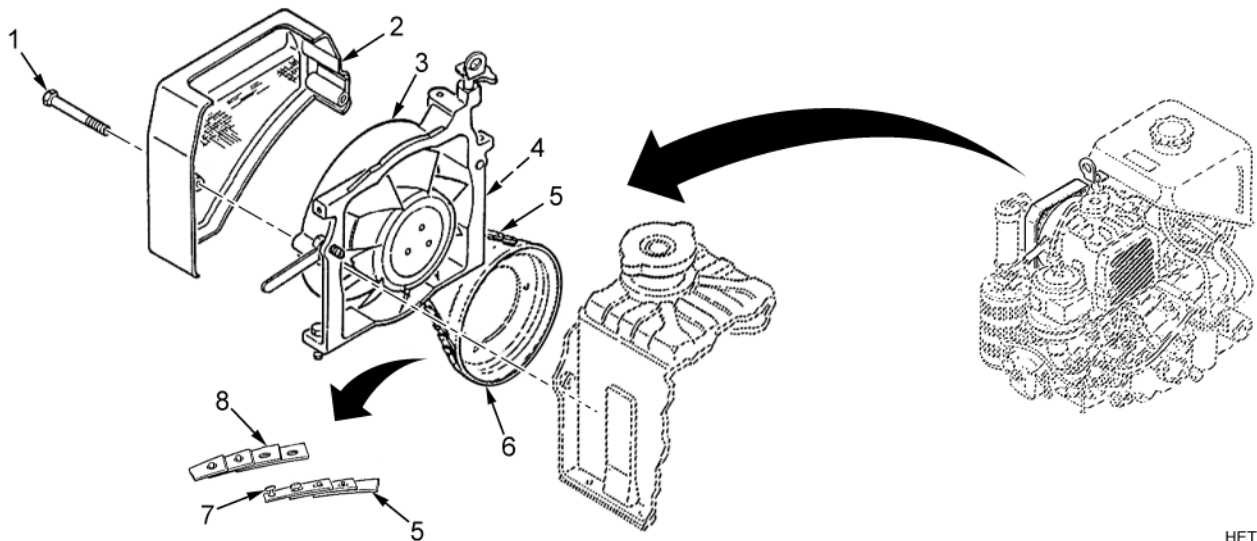
Recommended belt length is 43 links. The inside of vj g'belt points to the direction of travel of the belt.

2. Turn one tab and pry one link off of belt if necessary.
3. Turn any number of locking tabs needed to remove same number of line. Reassemble belt and check tension of belt after installation.

CAUTION

Ensure inner belt line is facing counterclockwise during installation or belt will be improperly installed, causing excess belt slippage.

4. Slide belt (Figure 2, Item 5) around flywheel pulley (Figure 2, Item 6), attach belt links (Figure 2, Item 8) to locking tabs (Figure 2, Item 7) and turn both locking tabs 90 degrees to secure belt.
5. Use handcrank to slowly turn motor (Figure 2, Item 4) over and carefully pull belt (Figure 2, Item 5) over fan pulley.
6. Install fan cover (Figure 2, Item 2) on fan vanaxle (Figure 2, Item 3) and secure with two bolts (Figure 2, Item 1).



HETT0582

Figure 2. Fan Belt.

END OF TASK

FOLLOW-ON MAINTENANCE

Start and run APU (WP 0005).

Check electrical connections (WP 0005).

END OF WORK PACKAGE

FIELD MAINTENANCE**FAN VANAXIAL**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)

Materials/Parts

Lockwasher (1) (TM 9-2330-381-24P)

Lockwasher (1) (TM 9-2330-381-24P)

Personnel Required

1

Equipment Conditions

Auxiliary Power Unit (APU) removed (WP 0128)

Starter removed (WP 0146)

APU wiring harness disconnected from fan vanaxial (WP 0064)

Hydraulic tank removed (WP 0126)

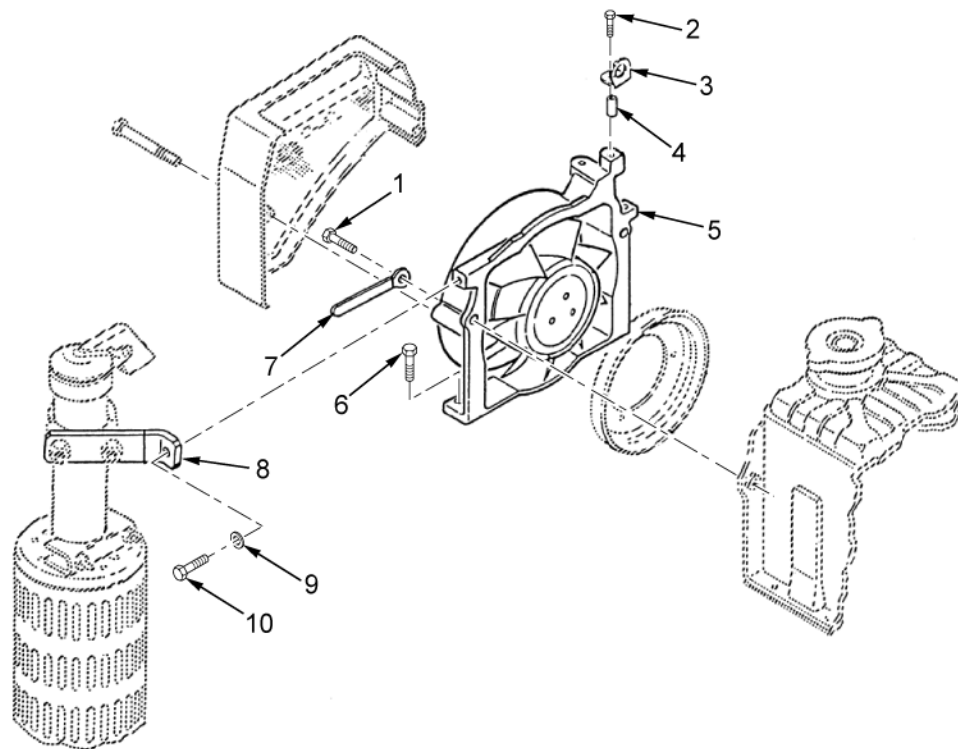
Fan belt removed (WP 0143)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the fan vanaxial.

REMOVAL

1. Remove two bolts (Figure 1, Item 1) and retaining strap (Figure 1, Item 7) from fan vanaxial (Figure 1, Item 5).
2. Remove bolt (Figure 1, Item 10) and lockwasher (Figure 1, Item 9) to disconnect bracket (Figure 1, Item 8) from fan vanaxial (Figure 1, Item 5). Discard lockwasher.
3. Remove bolt (Figure 1, Item 2), lifting eye (Figure 1, Item 3), and spacer (Figure 1, Item 4) from fan vanaxial.
4. Remove two bolts (Figure 1, Item 6) and fan vanaxial (Figure 1, Item 5).



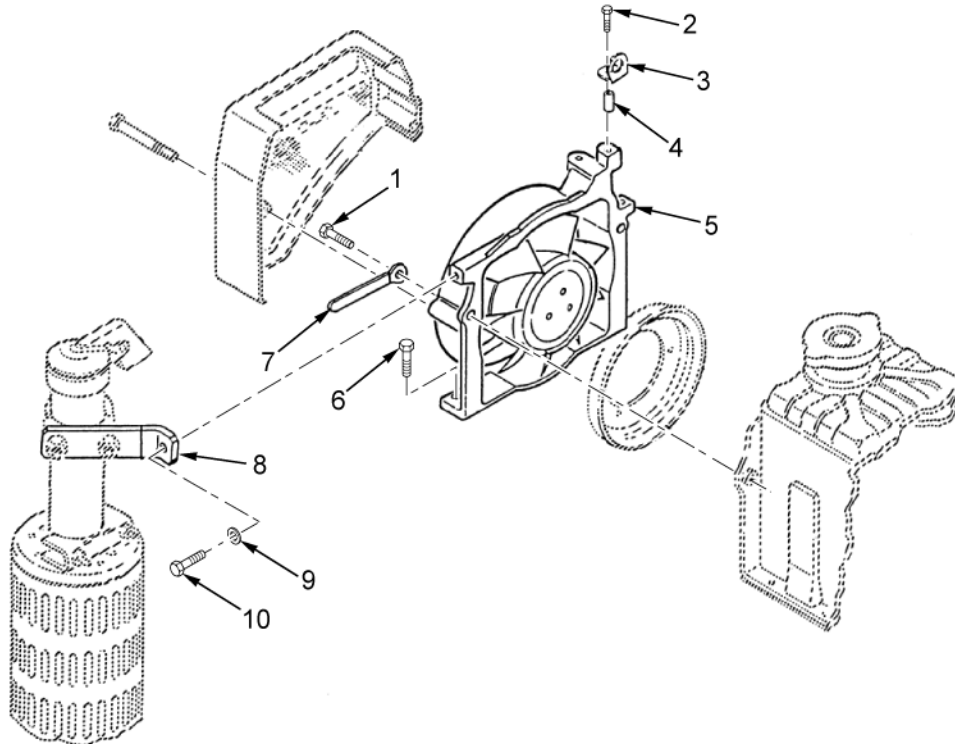
HETT0583

Figure 1. Fan Vanaxial.

END OF TASK

INSTALLATION

1. Install fan vanaxial (Figure 2, Item 5) and two bolts (Figure 2, Item 6).
2. Install spacer (Figure 2, Item 4), lifting eye (Figure 2, Item 3), and bolt (Figure 2, Item 2) on fan vanaxial (Figure 2, Item 5).
3. Connect bracket (Figure 2, Item 8) to fan vanaxial (Figure 2, Item 5) and secure with lockwasher (Figure 2, Item 9) and bolt (Figure 2, Item 10).
4. Install retaining strap (Figure 2, Item 7) and two bolts (Figure 2, Item 1) on fan vanaxial.



HETT0583

Figure 2. Fan Vanaxial.

END OF TASK**FOLLOW-ON MAINTENANCE**

Start and run APU (WP 0005).

Check electrical connections (WP 0005).

END OF WORK PACKAGE

FIELD MAINTENANCE**AUXILIARY POWER UNIT (APU) JUMP START SYSTEM**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (SATS) (WP 0168, Item 28)

Locknut (2) (TM 9-2330-381-24P)
Locknut (4) (TM 9-2330-381-24P)

Materials/Parts

Rag, Wiping (WP0170, Item 23)
Grommet (2) (TM 9-2330-381-24P)
Lockwasher (1) (TM 9-2330-381-24P)
Lockwasher (1) (TM 9-2330-381-24P)
Lockwasher (1) (TM 9-2330-381-24P)

Personnel Required

2

Equipment Conditions

Parked on level ground, gooseneck supported, if uncoupled,
and wheels chocked (WP 0013)

GENERAL INFORMATION

This work package contains instructions for the removal, repair, installation, and preoperational check of the Auxiliary Power Unit (APU) jump start system.

REMOVAL**WARNING**

- **Disconnect the power source before performing any corrective maintenance actions. DO NOT wear watches and jewelry while working on battery or other electrical components. Always DISCONNECT negative (-) cable FIRST and RECONNECT the negative (-) cable LAST.**
- **Ensure polarity, red (+) and black (-), is not reversed.**

Failure to follow these warnings may result in severe injury or death to personnel.

CAUTION

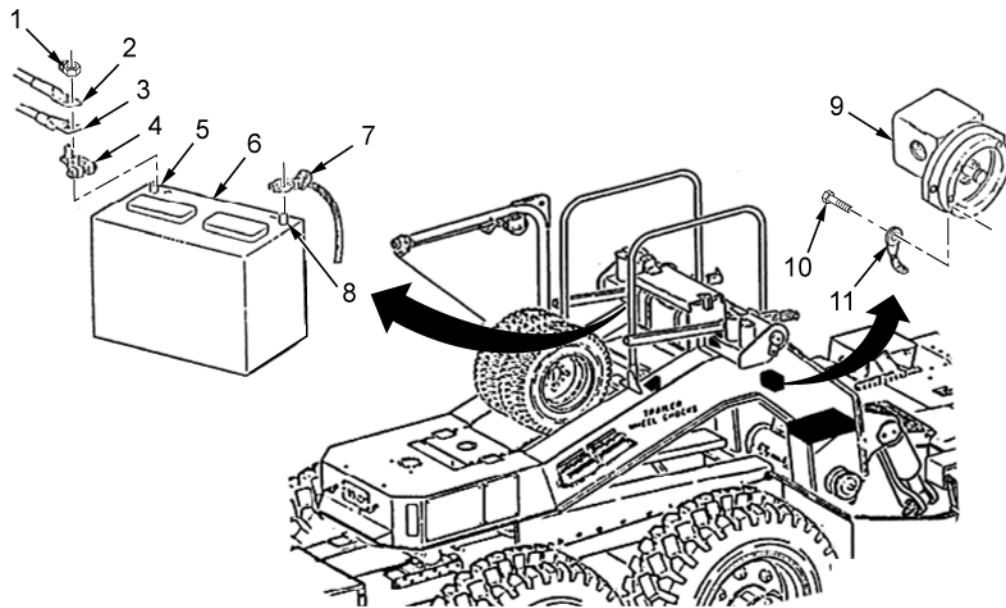
Some semitrailers have solar battery charger leads connected to negative and positive battery terminals. Ensure that these leads are not damaged when disconnecting the terminals from the battery.

1. Tag and disconnect negative (-) cable (Figure 1, Item 7) from negative (-) post (Figure 1, Item 8) on battery (Figure 1, Item 6).
2. Remove nut (Figure 1, Item 1) from terminal (Figure 1, Item 4) on positive (+) post (Figure 1, Item 5) on battery (Figure 1, Item 6). Tag and remove positive (+) cables (Figure 1, Item 2 and Item 3) from terminal.

NOTE

If a fault is limited to the APU, jump start system's electrical box. The existing cable that connects the battery and APU starter can be left installed so that the semitrailer is still mission ready.

3. If necessary, reconnect positive (+) cable (Figure 1, Item 3) (which connects battery to APU starter) onto terminal (Figure 1, Item 4) on positive (+) post (Figure 1, Item 5) of battery (Figure 1, Item 6) and secure with nut (Figure 1, Item 1).
4. Remove bolt (Figure 1, Item 10). Tag and remove cable (Figure 1, Item 11) from streetside of APU hydraulic pump (Figure 1, Item 9). Reinstall and tighten bolt.
5. If semitrailer is needed for a mission, connect negative (-) cable (Figure 1, Item 7) to negative (-) post (Figure 1, Item 8) on battery (Figure 1, Item 6). If not needed for a mission, proceed to step 6.



HETT0808

Figure 1. APU Jump Start System.

6. Remove two locknuts (Figure 2, Item 4) and four cable clamps (Figure 2, Item 2) from cables (Figure 2, Item 1 and Item 3). Discard locknuts.
7. Remove four locknuts (Figure 2, Item 7), bolts (Figure 2, Item 5), and electrical box (Figure 2, Item 6) from gooseneck (Figure 2, Item 8). Discard locknuts.
8. With aid of an assistant, loosen straps (Figure 2, Item 10) and remove bag (Figure 2, Item 11) from crossbar (Figure 2, Item 9). Ensure jump start cables (Figure 2, Item 12) remain coiled in bag for ease of transport.

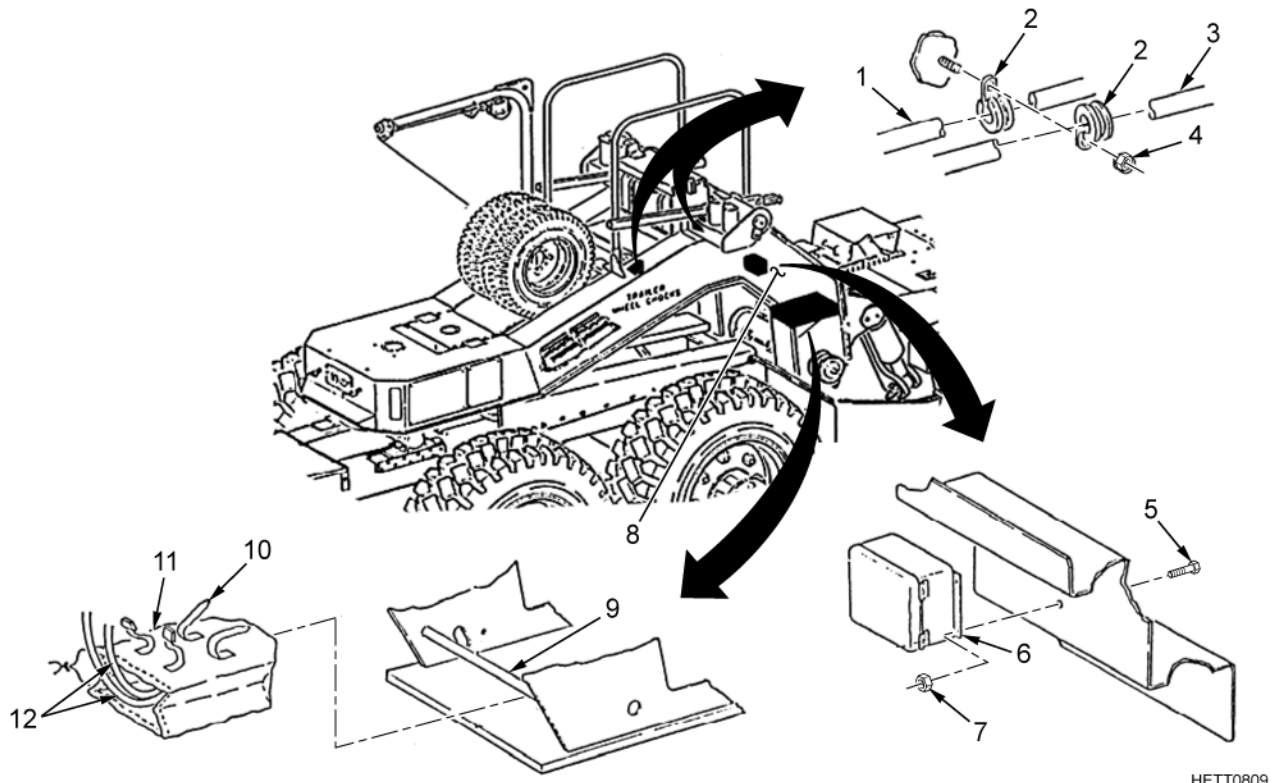
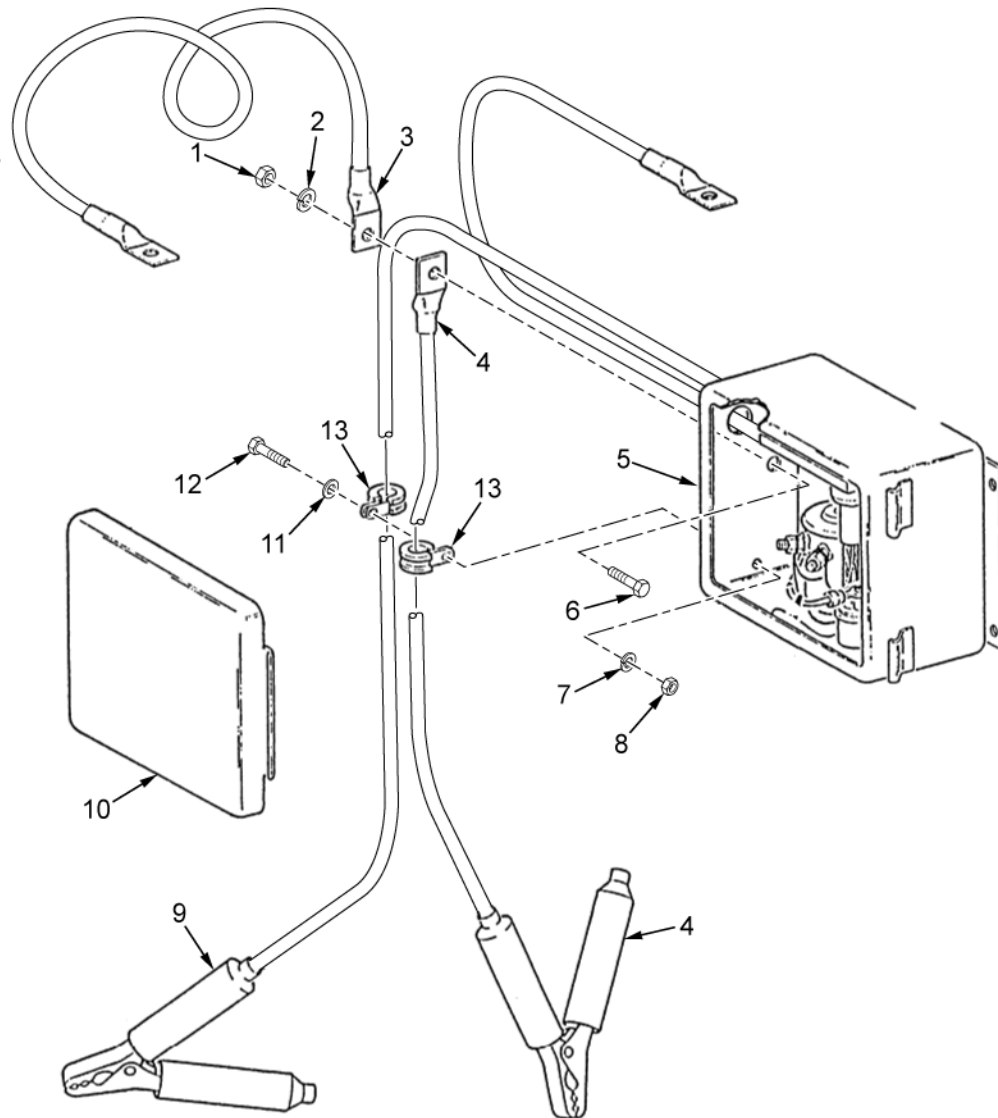


Figure 2. APU Jump Start System.

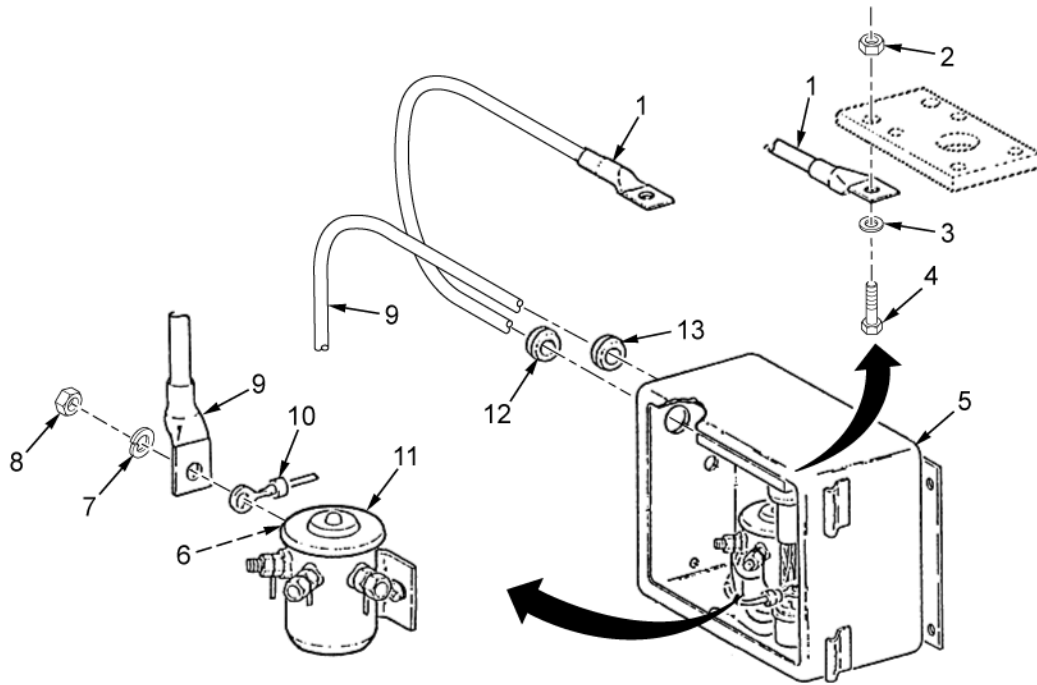
9. Remove cover (Figure 3, Item 10) from electrical box (Figure 3, Item 5).
10. Remove nut (Figure 3, Item 8), lockwasher (Figure 3, Item 7), washer (Figure 3, Item 11), screw (Figure 3, Item 12), and two cable clamps (Figure 3, Item 13) from cables (Figure 3, Item 4 and Item 9). Discard lockwasher.
11. Remove nut (Figure 3, Item 1) and lockwasher (Figure 3, Item 2) from bolt (Figure 3, Item 6). Tag and remove cables (Figure 3, Item 4 and Item 3). Remove bolt. Discard lockwasher.



HETT0798

Figure 3. APU Jump Start System.

12. Remove nut (Figure 4, Item 8) and lockwasher (Figure 4, Item 7) from stud number four (Figure 4, Item 6) of solenoid (Figure 4, Item 11). Tag and remove cable (Figure 4, Item 9) and jumper (Figure 4, Item 10). Retain lockwasher. Remove and discard grommet (Figure 4, Item 13).
13. Remove nut (Figure 4, Item 2), lockwasher (Figure 4, Item 3), and capscrew (Figure 4, Item 4) from cable (Figure 4, Item 1) and electrical box (Figure 4, Item 5). Tag and remove cable and grommet (Figure 4, Item 12). Discard lockwasher and grommet.



HETT0810

Figure 4. APU Jump Start System.

END OF TASK

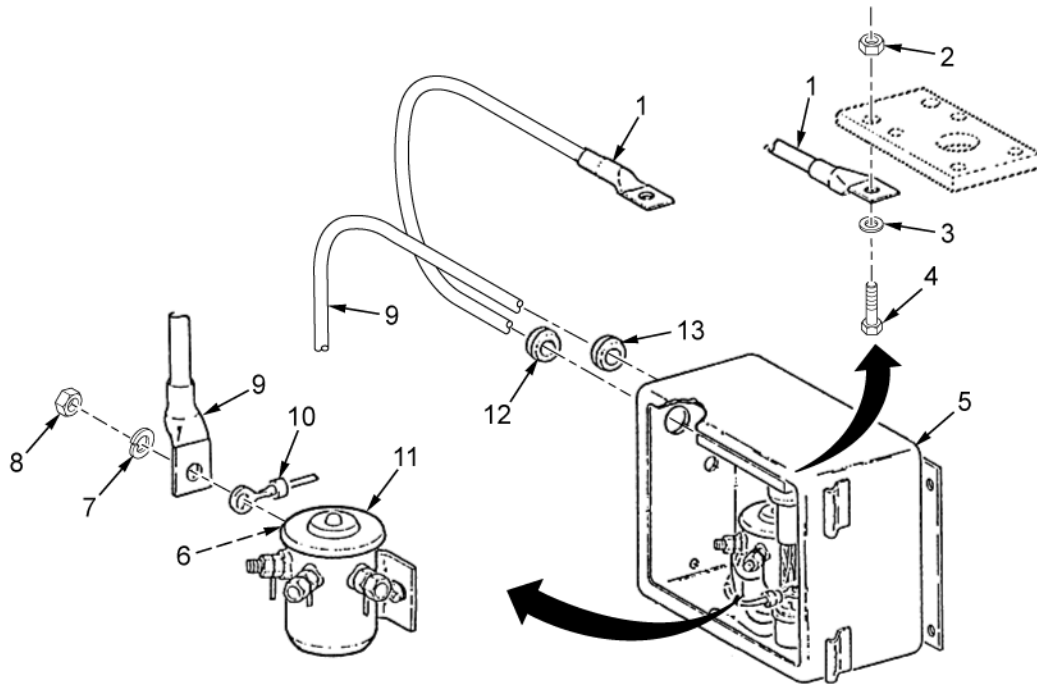
REPAIR

1. Inspect cables for corrosion, frayed or broken wires, and defective terminal lugs and battery clamps. If corroded, clean as required by wiping with a wiping rag. If loose, remove and replace terminal lugs as required using electrical repair kit. If defect exists, use electrical repair kit and replace defective terminal lug, battery clamp, and/or wiring harness.
2. Inspect protective covering for damage and for missing or unreadable wire markers. If defect exists, replace markers as required.
3. Inspect jumper wires for frayed or broken wires and loose terminal lugs. If defect exists, replace defective terminal lugs using electrical repair kit or replace entire jumper wire assembly.

END OF TASK

INSTALLATION

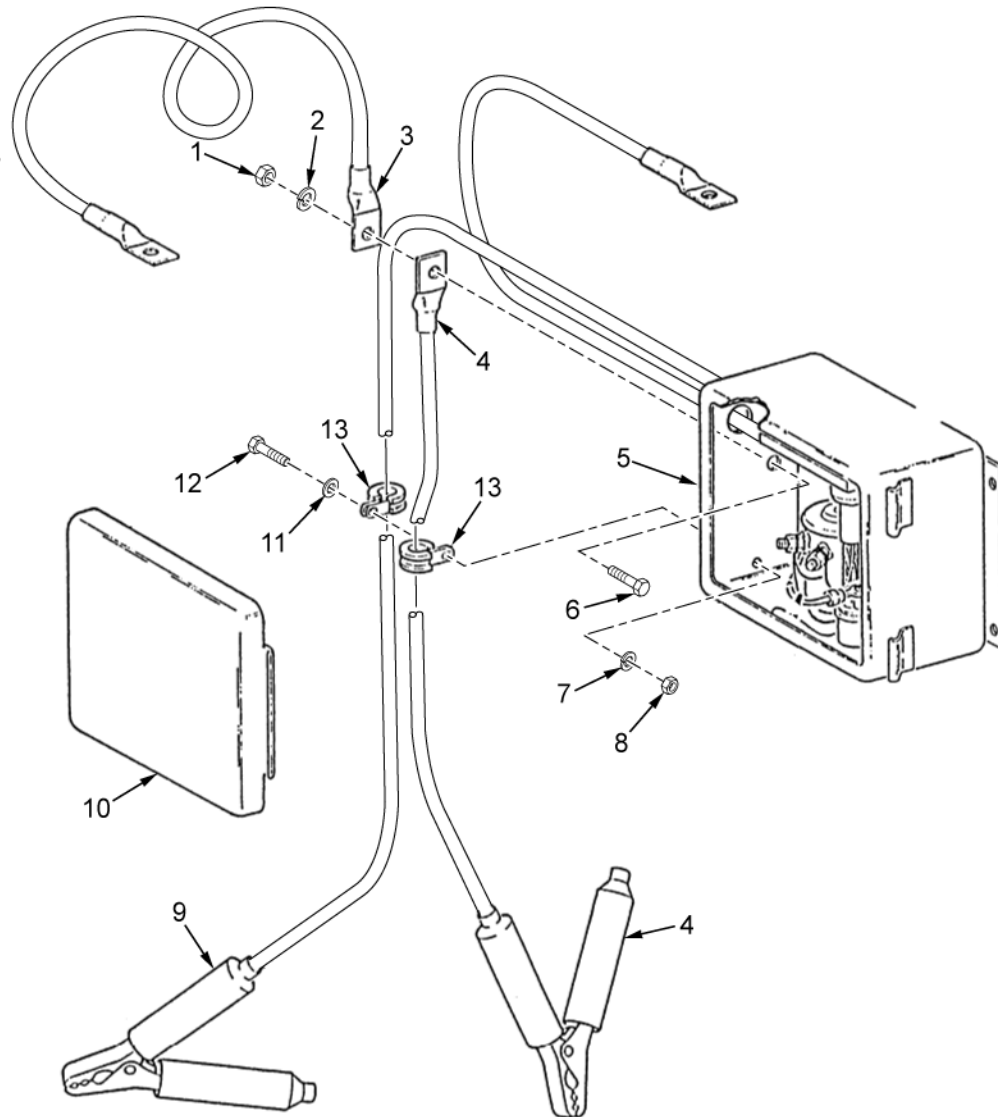
1. Insert cable (Figure 5, Item 1) and grommet (Figure 5, Item 12) in electrical box (Figure 5, Item 5).
2. Attach cable (Figure 5, Item 1) with capscrew (Figure 5, Item 4), lockwasher (Figure 5, Item 3), and nut (Figure 5, Item 2).
3. Insert grommet (Figure 5, Item 13) and cable (Figure 5, Item 9) in electrical box (Figure 5, Item 5).
4. Reconnect jumper (Figure 5, Item 10) and cable (Figure 5, Item 9) to stud number four (Figure 5, Item 6) of solenoid (Figure 5, Item 11) and secure with lockwasher (Figure 5, Item 7) and nut (Figure 5, Item 8).



HETT0810

Figure 5. APU Jump Start System.

5. Reconnect bolt (Figure 6, Item 6) and insert bolt through side of electrical box (Figure 6, Item 5).
6. Attach two cables (Figure 6, Item 4 and Item 3) to bolt (Figure 6, Item 6) and secure with lockwasher (Figure 6, Item 2) and nut (Figure 6, Item 1).
7. Install two cable clamps (Figure 6, Item 13) to cables (Figure 6, Item 9 and Item 4) and secure with screw (Figure 6, Item 12), washer (Figure 6, Item 11), lockwasher (Figure 6, Item 7), and nut (Figure 6, Item 8).
8. Install cover (Figure 6, Item 10) to electrical box (Figure 6, Item 5).



HETT0798

Figure 6. APU Jump Start System.

WARNING

- **Disconnect the power source before performing any corrective maintenance actions. DO NOT wear watches and jewelry while working on battery or other electrical components. Always DISCONNECT negative (-) cable FIRST and RECONNECT the negative (-) cable LAST.**
- **Ensure polarity, red (+) and black (-), is not reversed.**

Failure to follow these warnings may result in severe injury or death to personnel.

CAUTION

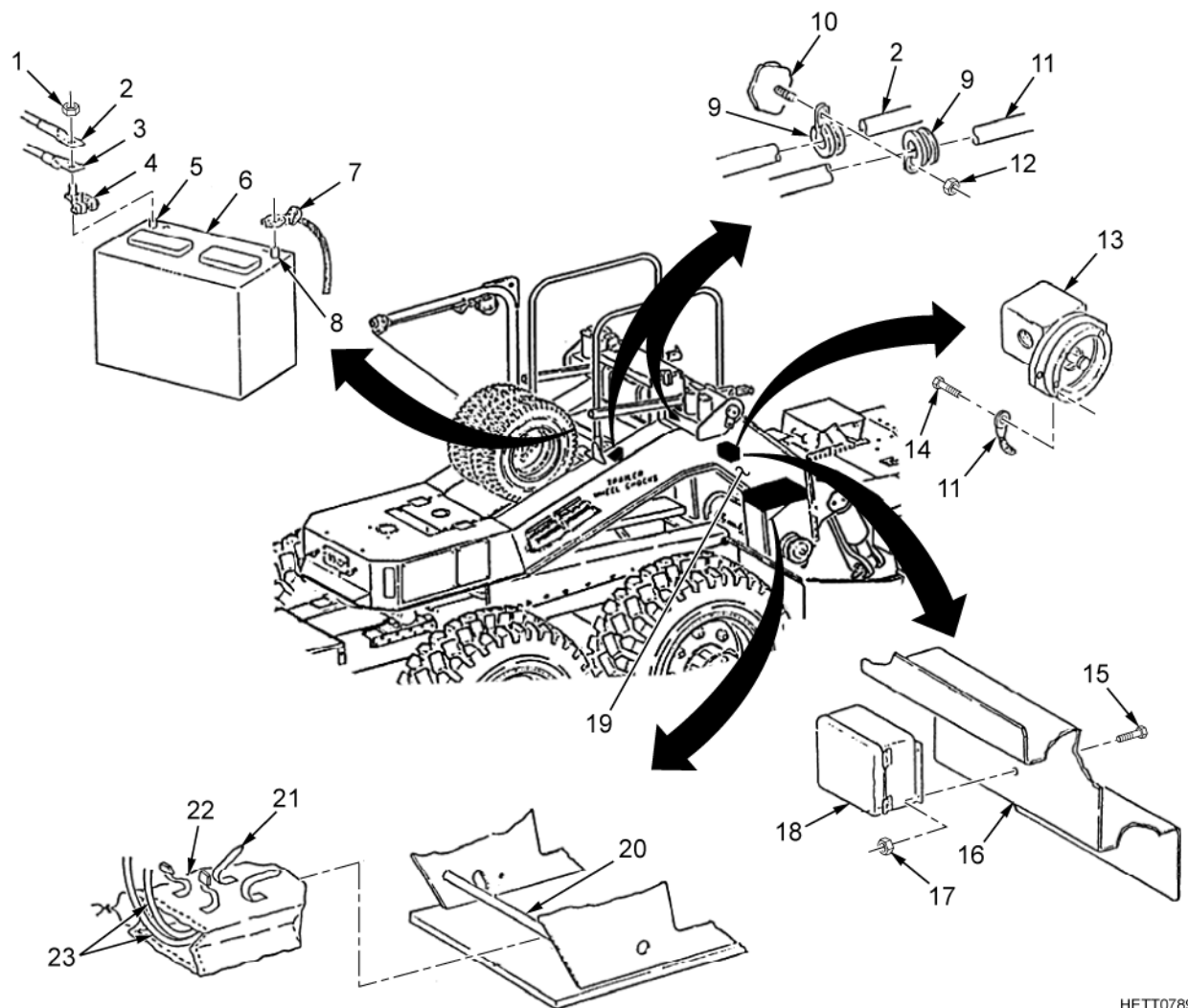
Some semitrailers have solar battery charger leads connected to negative and positive battery terminals. Ensure that these leads are not damaged when disconnecting the terminals from the battery.

9. If necessary, tag and disconnect negative (-) cable (Figure 7, Item 7) from negative (-) post (Figure 7, Item 8) on battery (Figure 7, Item 6).
10. Use two people to secure bag (Figure 7, Item 22) to crossbar (Figure 7, Item 20) with straps (Figure 7, Item 21). Ensure bag opening (Figure 7, Item 23) is facing toward front of gooseneck (Figure 7, Item 19).
11. Align and install electrical box (Figure 7, Item 18) to underside of gooseneck step (Figure 7, Item 16) and secure with four bolts (Figure 7, Item 15) and locknuts (Figure 7, Item 17).
12. Secure cables (Figure 7, Item 2 and Item 11) to inner gooseneck wall (Figure 7, Item 10) with four cable clamps (Figure 7, Item 9) and two locknuts (Figure 7, Item 12).
13. Remove bolt (Figure 7, Item 14) from streetside of APU hydraulic pump (Figure 7, Item 13). Install cable (Figure 7, Item 11) with bolt to streetside of APU hydraulic pump.

CAUTION

DO NOT exceed torque when installing nut. Threaded post on terminal is soft material and threads will strip easily, causing damage to equipment.

14. Remove nut (Figure 7, Item 1) from terminal (Figure 7, Item 4) on positive (+) post (Figure 7, Item 5) of battery (Figure 7, Item 6).
15. Leave existing cable (Figure 7, Item 3) on terminal (Figure 7, Item 4).
16. Install positive (+) cable (Figure 7, Item 2) on terminal (Figure 7, Item 4) and secure with nut (Figure 7, Item 1). Torque nut to 10 to 12 lb-ft (13.5 to 16.3 Nm).
17. Reconnect negative (-) cable (Figure 7, Item 7) to negative (-) post (Figure 7, Item 8) of battery (Figure 7, Item 6).



HETT0789

Figure 7. APU Jump Start System.

PREOPERATIONAL CHECK**NOTE**

The following is a preoperational check of the APU jump start system.

1. If tractor (Figure 8, Item 16) is coupled to trailer (Figure 8, Item 6), start tractor engine and open APU battery (Figure 8, Item 1) box.
2. If tractor (Figure 8, Item 16) is not coupled to tractor trailer (Figure 8, Item 6), drive tractor to a point near gooseneck (Figure 8, Item 15) where tractor batteries (Figure 8, Item 14) can be easily reached. Keep tractor engine running and open battery (Figure 8, Item 1) box.

CAUTION

Some semitrailers have solar battery charger leads connected to negative and positive battery terminals. Ensure these leads are not damaged when disconnecting terminals from battery posts or damage to equipment may result.

3. Disconnect negative (-) cable (Figure 8, Item 3) from negative (-) post (Figure 8, Item 2) of battery (Figure 8, Item 1).
4. Loosen drawstring (Figure 8, Item 10) of cable storage bag (Figure 8, Item 9) and pull out jumper cables (Figure 8, Item 7 and Item 8). Negative (-) cable (Figure 8, Item 7) is approximately 9 ft (2.75 m) in length and has a black clamp on end. Positive (+) cable (Figure 8, Item 8) is approximately 28 ft (8.5 m) in length and has a red clamp on end.
5. Connect positive (+) cable (Figure 8, Item 8) to 12 VDC terminal (Figure 8, Item 13) on parallel side of tractor's series/parallel battery installation to jump start APU.
6. Connect negative (-) cable (Figure 8, Item 7) to tractor frame (Figure 8, Item 11) and ensure a good connection.
7. Press switch (Figure 8, Item 5) on electrical box (Figure 8, Item 4) and listen for the following:
 - a. If system is installed correctly, an audible click will be heard as solenoid engages when switch (Figure 8, Item 5) is pushed on electrical box (Figure 8, Item 4).
 - b. If system is installed incorrectly or jumper cables (Figure 8, Item 7 and Item 8) receive improper voltage, solenoid will not engage and APU starter will not function.
8. Disconnect negative (black) clamp (-) on cable (Figure 8, Item 7) from tractor frame (Figure 8, Item 11) and positive (red) clamp (+) on cable (Figure 8, Item 8) from positive (+) terminal (Figure 8, Item 12) of tractor battery (Figure 8, Item 14) and restore in stowage bag (Figure 8, Item 9).
9. Reconnect negative (-) cable (Figure 8, Item 3) to negative (-) post (Figure 8, Item 2) of APU battery (Figure 8, Item 1).

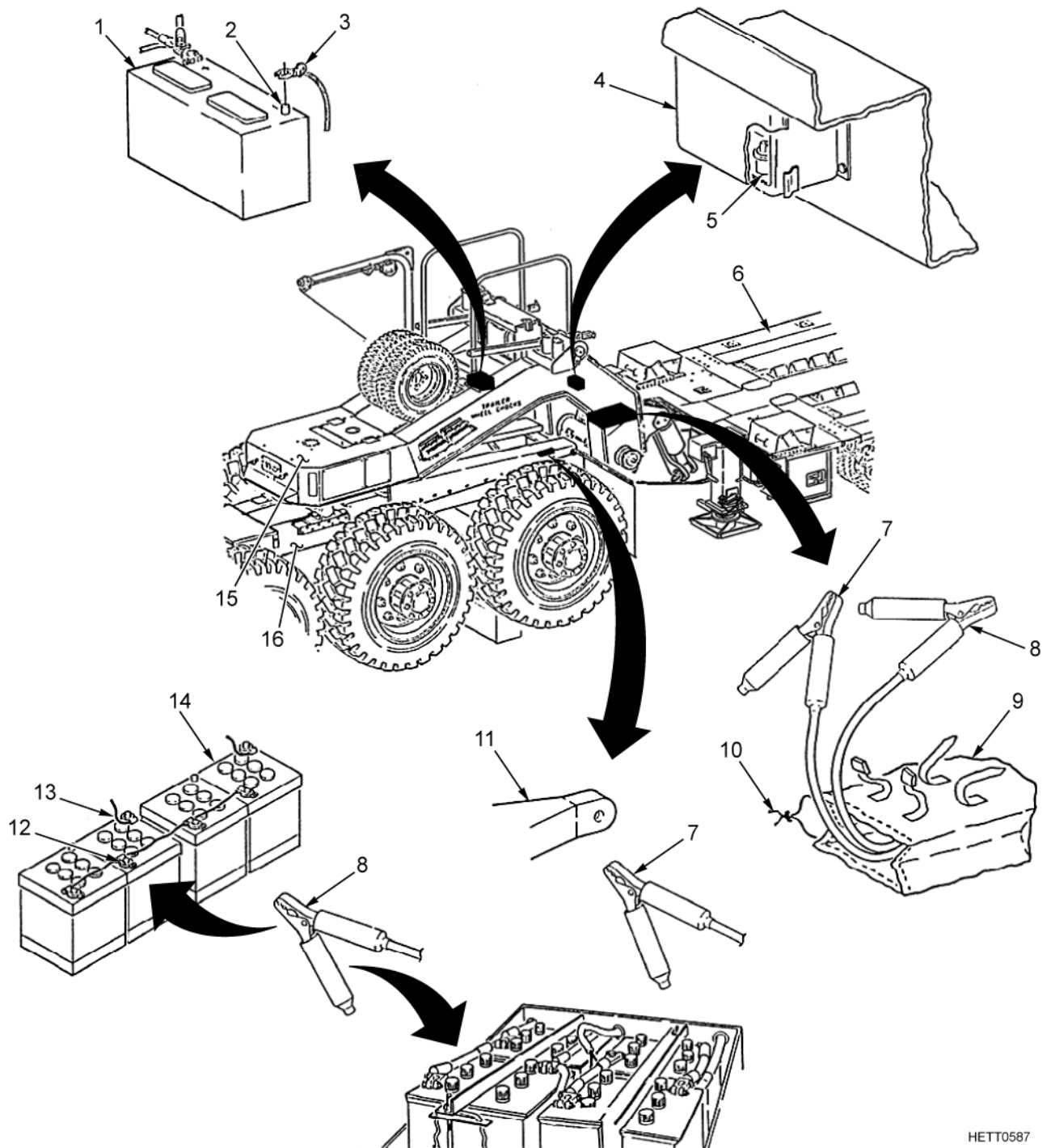


Figure 8. APU Jump Start System.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**STARTER**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)

Personnel Required

1

Materials/Parts

Strap, Tiedown (as required) (WP 0170, Item 33)

Lockwasher (1) (TM 9-2330-381-24P)

Equipment Conditions

Battery cables disconnected at battery (WP 0053)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the starter.

REMOVAL

1. If applicable, remove tiedown strap (Figure 1, Item 8) and pull terminal cover (Figure 1, Item 7) back. Remove nut (Figure 1, Item 6) and lockwasher (Figure 1, Item 5) and disconnect battery cable (Figure 1, Item 4) and starter (hot) wire (Figure 1, Item 3) from solenoid (Figure 1, Item 2). Discard lockwasher.
2. Disconnect starter wire (Figure 1, Item 9) from solenoid (Figure 1, Item 2).
3. Remove two bolts (Figure 1, Item 1) and remove starter assembly (Figure 1, Item 10).

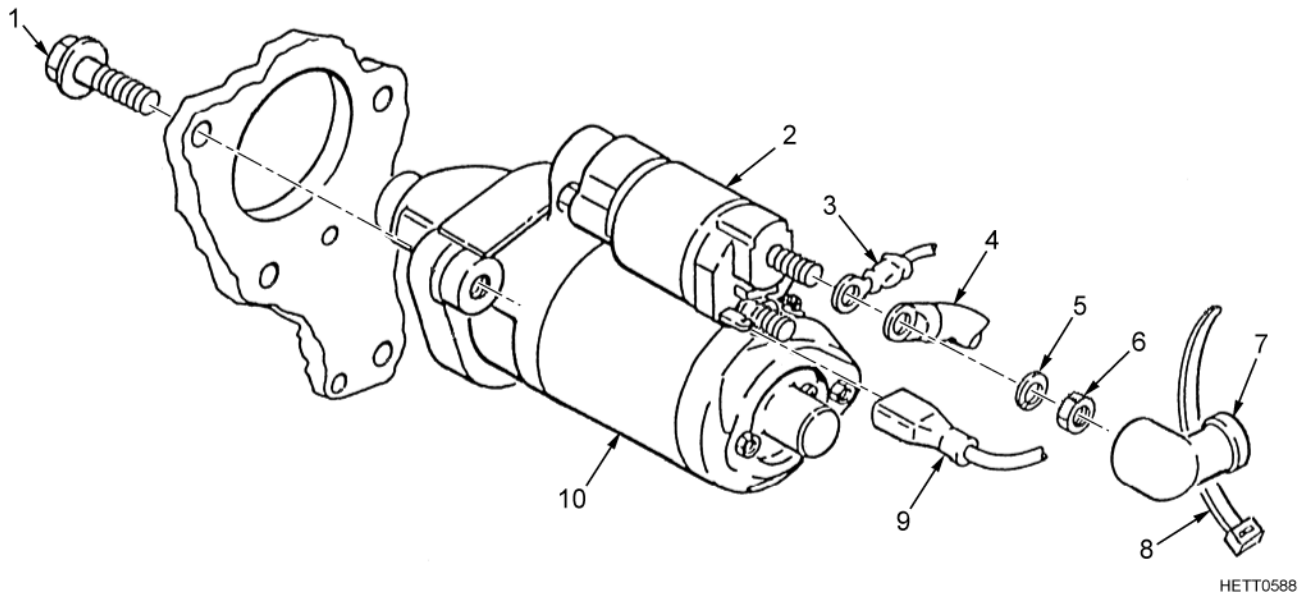


Figure 1. Starter.

END OF TASK

INSTALLATION

1. Install starter assembly (Figure 2, Item 10) and secure with two bolts (Figure 2, Item 1).
2. Reconnect starter wire (Figure 2, Item 9) to solenoid (Figure 2, Item 2).

CAUTION

DO NOT exceed torque when installing nut. Threaded post on terminal is soft material, and threads will strip easily causing damage to equipment.

3. Connect starter (hot) wire (Figure 2, Item 3) and battery cable (Figure 2, Item 4) to solenoid (Figure 2, Item 2).
4. Install lockwasher (Figure 2, Item 5) and nut (Figure 2, Item 6). Torque nut to 6 to 8 lb-ft (8.2 to 10.9 Nm).
5. Push terminal cover (Figure 2, Item 7) over nut (Figure 2, Item 6) and secure with tiedown strap (Figure 2, Item 8).

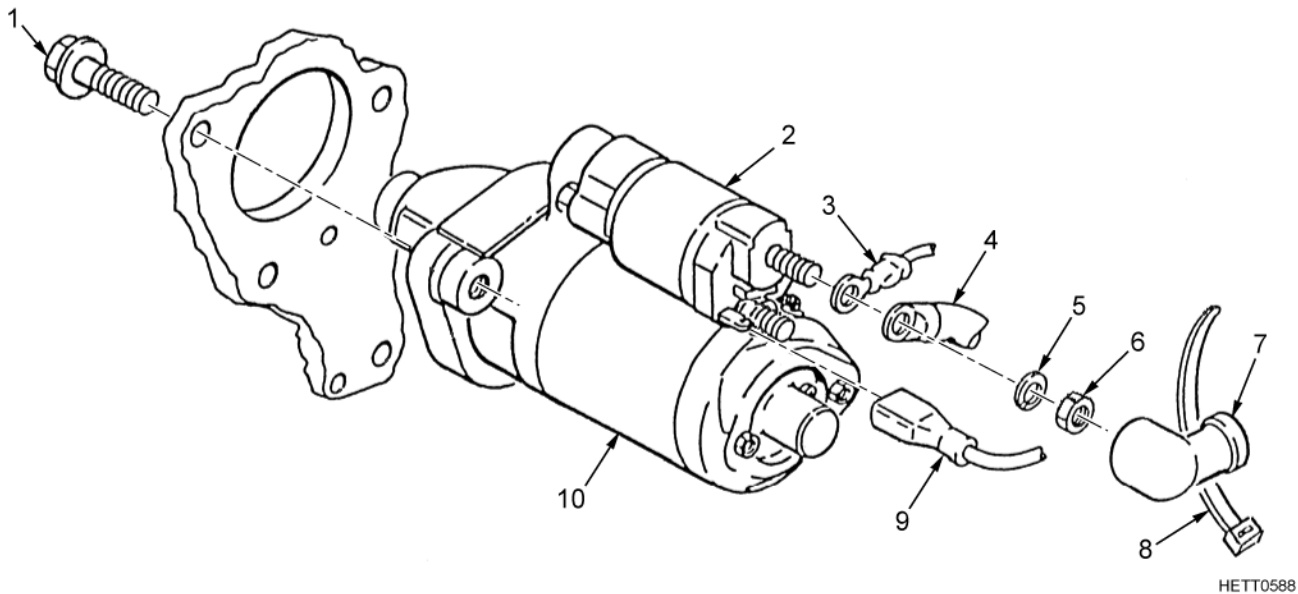


Figure 2. Starter.

END OF TASK**FOLLOW-ON MAINTENANCE**

Start and run Auxiliary Power Unit (APU) (WP 0005).

END OF WORK PACKAGE

FIELD MAINTENANCE
WELDING/NONDESTRUCTIVE TESTING

INITIAL SETUP:

References

TM 9-237
MIL-STD-410
MIL-I-6870
MIL-STD-6866

WELDING

WARNING



Welding and brazing operations produce heat, toxic fumes, radiation, metal slag, and carbon particles. Welding and brazing goggles with properly tinted lenses are required. Also, gloves, apron, and welding boots are required or injury to personnel may result. Failure to follow this warning may result in severe injury or death to personnel.

1. Welding and brazing processes may be used to repair cracks in steel parts such as brackets, panels, and light framework; however, the time required, the difficulty of working with the metal, and the chance of embrittlement and subsequent failure make such repairs of questionable value. Hence, welding and brazing should only be attempted when replacement parts are not available. Since the semitrailer is designed to carry greatly concentrated loads, most of the structure requires specialized welding procedures. Any personnel performing repair welding on the semitrailer must be properly trained and certified to conduct all phases of the welding procedure. After any welding, an inspection must be conducted.

NONDESTRUCTIVE TESTING**WARNING**

Fluorescent penetrant may cause injury to personnel. Avoid skin contact. In case of skin contact, wash with warm water and soap. Failure to follow this warning may result in severe injury or death to personnel.

1. Fluorescent penetrant inspection. A fluorescent penetrant inspection must be performed on metallic components that have been welded. After fluorescent penetrant has been applied and a pattern has developed, any evidence of cracks is cause for rejection. This inspection should be performed on parts as prescribed in MIL-I-6870 by operators and inspectors certified in accordance with MIL-STD-410, with equipment according to MIL-STD-6866.
2. Magnetic particle inspection. This inspection should be performed on steel parts when possible. Steel parts that have been reworked or reground and parts containing areas of fatigue should be tested. Shear sections and reground contact surfaces must show no defects. Any evidence of cracks is cause for rejection. Since some stainless steel cannot be magnetized, do not perform this test on such components. This inspection must be performed as specified in MIL-I-6870 and MIL-STD-6866 by qualified operators and inspected by qualified inspectors. On completion of inspection, pass parts through a demagnetizing field. Wash parts and allow to air dry. Parts must be rejected if there are indications of nonmetallic foreign solids longer than 1 in. (2.54 cm). Parts shall also be rejected if the following patterns appear:
 - a. Bursts - scattered, short, sharp lines caused by high temperatures. Such discontinuities usually are internal and are seldom detected by magnetic particle inspection until surface is cut to expose burst area.
 - b. Flakes - separate, short, wavy lines, usually in the same general direction, caused by improper cooling. Flakes are usually internal and are seldom detected by magnetic particle inspection until surface has been cut to expose the flake area.
 - c. Grinding cracks - fine, sharp lines, tightly packed. In some surfaces, cracks may be shallow and hard to see. Grinding cracks are usually caused by a glazed wheel, resulting in overheating. These cracks are similar to heat-treat and hardening cracks. Grinding cracks may also be caused by too little coolant, too much feed, or too much speed.

END OF WORK PACKAGE

FIELD MAINTENANCE

UPPER SUSPENSION ARM BEARING

INITIAL SETUP:

Tools and Special Tools

Bearing Seating Tool (WP 0164, Figure F-4)
 General Mechanic's Tool Kit (WP 0168, Item 11)
 Fire Extinguisher (WP 0168, Item 15)
 Welder Helmet (WP 0168, Item 16)
 Apron, Leather (WP 0168, Item 17)
 Lifting Strap (WP 0168, Item 25)
 Truck, Wrecker (WP 0168, Item 26)
 Standard Army Tool Set (SATS) (WP 0168, Item 28)

Grease (WP 0170, Item 16)
 Rag, Wiping (WP 0170, Item 23)
 Solvent, Dry Cleaning (WP 0170, Item 32)
 Bearing Cone (Upper Suspension Arm)
 Wood Block, 4-in. x 4-in. x 12 in. lg

Personnel Required

2

Equipment Conditions

Suspension assembly removed (WP 0065)

Materials/Parts

Crocus Cloth (WP 0170, Item 6)

GENERAL INFORMATION

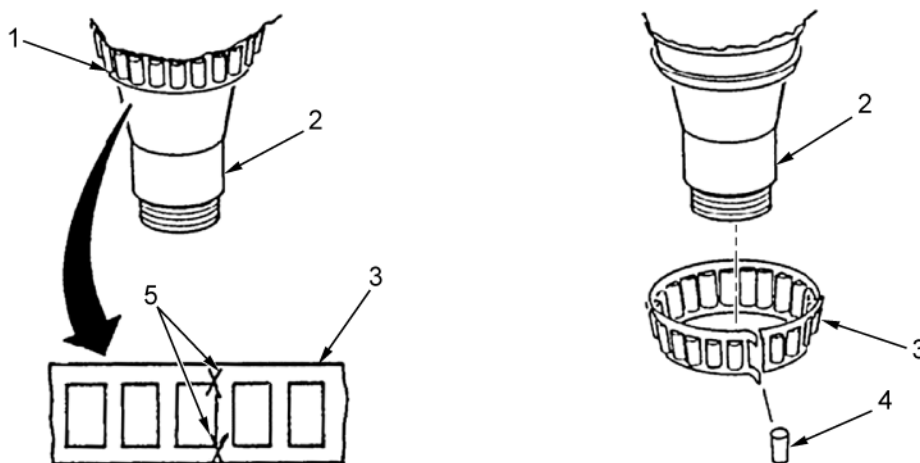
This work package contains instructions for the removal, repair, and installation of the upper suspension arm bearing.

REMOVAL

CAUTION

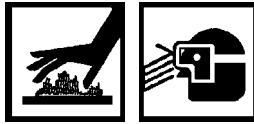
The upper suspension bearing cone will be destroyed during removal. Pay close attention to the following steps or serious damage to platform spindle may result.

1. Remove upper suspension bearing cone (Figure 1, Item 1) from platform spindle (Figure 1, Item 2) as follows:
 - a. Using a hammer and cold chisel, break bearing cage (Figure 1, Item 3) at two points (Figure 1, Item 5).
 - b. Once bearing cage (Figure 1, Item 3) is broken, remove all bearing rollers (Figure 1, Item 4).
 - c. Clean all grease from spindle (Figure 1, Item 2) and surrounding area with wiping rag.



HETT0594

Figure 1. Upper Suspension Arm Bearing Removal.

WARNING

- While using the oxygen/acetylene gas welding/cutting unit, wear properly tinted goggles and protective gloves.
- Once the inner bearing cone of upper suspension bearing is heated, it will expand and fall off of platform spindle. Position both personnel so that heated cone does not come in contact with personnel.
- The ground under the platform spindle must be free of flammable material prior to heating the upper bearing cone. Place burn cloth on the ground beneath the platform spindle.

Failure to follow these warnings may result in severe injury or death to personnel.

CAUTION

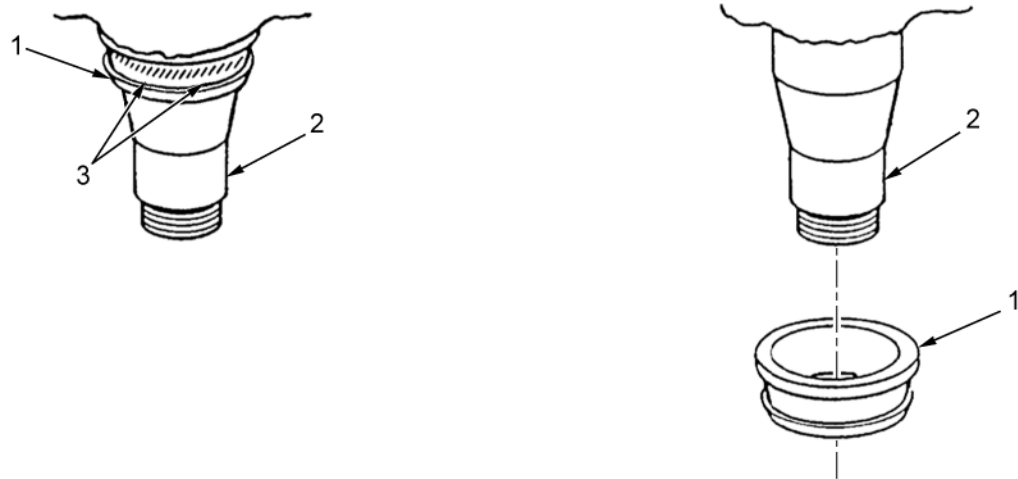
Use two personnel to heat the upper suspension bearing's inner bearing cone by applying heat to the middle of the inner bearing cone around the entire cone. **DO NOT** allow torch to heat platform spindle or serious damage to equipment may result.

2. Using an oxygen/acetylene unit, pass a torch between two personnel and evenly heat entire inner bearing cone (Figure 2, Item 1) at middle of cone (Figure 2, Item 3). When inner bearing cone (Figure 2, Item 1) is uniformly heated, it will expand and drop off of platform spindle (Figure 2, Item 2).

WARNING

DO NOT pick up the inner bearing cone while hot. Failure to follow this warning may result in severe injury or death to personnel.

- a. Allow inner bearing cone (Figure 2, Item 1) to cool and discard all parts of upper suspension bearing.



HETT0595

Figure 2. Upper Suspension Arm Bearing Removal.

END OF TASK**REPAIR**

1. Hand-pack new upper suspension bearing cone with grease.

END OF TASK

INSTALLATION

1. Position new upper suspension bearing cone (Figure 3, Item 3) onto platform spindle (Figure 3, Item 2). Tap lightly into place with a hammer.

CAUTION

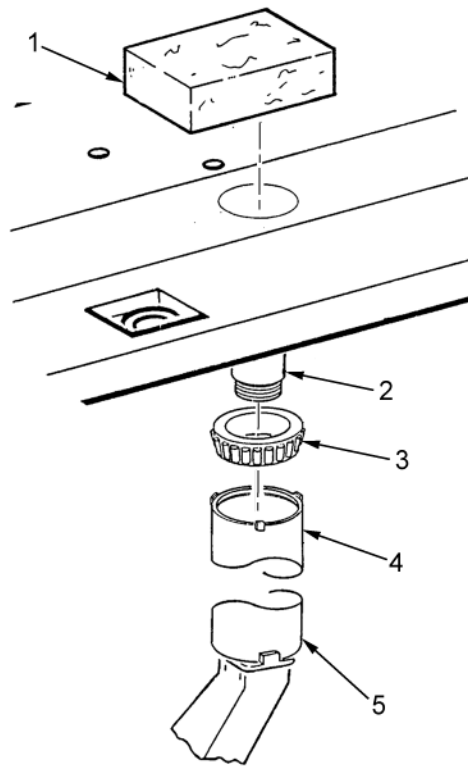
Position bearing seating tool carefully on floor jack and ensure tool is as vertical as possible or damage to spindle may result.

2. Position bearing seating tool (Figure 3, Item 4), with tabs up, under upper suspension bearing cone (Figure 3, Item 3). Position hydraulic floor jack (Figure 3, Item 5) under bearing seating tool, and raise floor jack until tool is flush against bearing.

CAUTION

During this entire task, continually check that the top of the bearing seating tool remains parallel to the platform. The bearing must be installed as level to the platform as possible or damage to equipment may result.

3. With bearing cone (Figure 3, Item 3) level, and centered at bottom of spindle (Figure 3, Item 2), slowly raise floor jack (Figure 3, Item 5) to push bearing onto spindle.
4. If platform starts to rise from movement of floor jack (Figure 3, Item 5) before bearing cone (Figure 3, Item 3) is properly seated on spindle (Figure 3, Item 2), proceed as follows:
 - a. Place a block of wood (Figure 3, Item 1) on top of platform, centered over top of spindle (Figure 3, Item 2).
 - b. Using a 10-pound sledge hammer, one person must proceed to strike wood block (Figure 3, Item 1) as second person raises floor jack (Figure 3, Item 5). Repeat as necessary until bearing cone (Figure 3, Item 3) is properly seated on spindle (Figure 3, Item 2).
 - c. Lower floor jack (Figure 3, Item 5) and remove bearing seating tool (Figure 3, Item 4).



HETT0596

Figure 3. Upper Suspension Arm Bearing Removal.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**DRUM TURNING**

INITIAL SETUP:**Tools and Special Tools**

Standard Army Tool Set (SATS) (WP 0168, Item 28)

Equipment Conditions

Hub and drum disassembled and separated (WP 0075)

Personnel Required

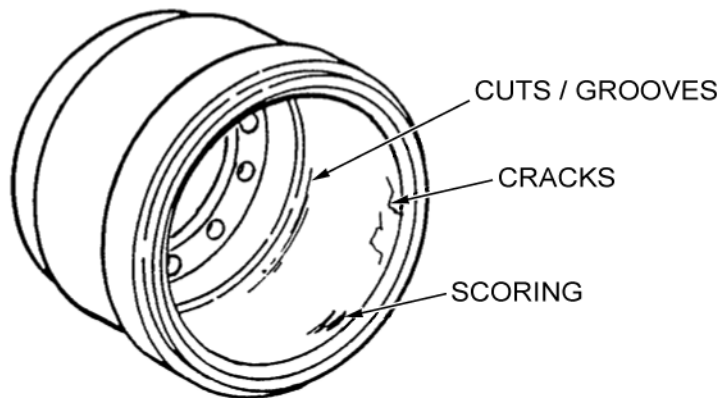
1

GENERAL INFORMATION

This work package contains instructions for drum turning repair.

REPAIR

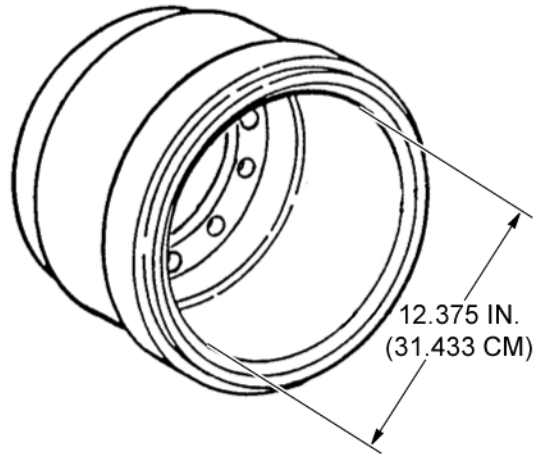
1. Inspect machined surface texture of drum for grooves, cuts, scoring, surface cracks, and out-of-roundness (Figure 1).



HETT0597

Figure 1. Drum Turning Inspection.

2. Use brake drum gauge to measure inner diameter of drum (Figure 2). If inside diameter of drum is greater than 12.375 in. (31.433 cm), replace drum. If inside diameter is less than 12.375 in. (31.433 cm) and any defects are found, drum must be turned (machined).
3. Install drum on brake drum lathe and turn drum as required until smooth finish can be obtained. If after a series of attempts a smooth finish cannot be obtained, discard drum.
4. If smooth finish is obtained, remeasure inside diameter. If inside diameter exceeds 12.375 in. (31.433 cm), discard drum and replace.
5. If smooth finish is obtained and maximum inside diameter is less than 12.375 in. (31.433 cm), the drum has been repaired.



HETT0598

Figure 2. Drum Turning Dimension.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

AXLE ASSEMBLY

INITIAL SETUP:

Tools and Special Tools

Hone, Cylinder 2 in. to 7 in. Port (WP 0168, Item 9)
 General Mechanic's Tool Kit (WP 0168, Item 11)
 Kit, Axle Rem/Instl (WP 0168, Item 20)
 Ram, Hyd, 50 Ton Portable (WP 0168, Item 24)
 Standard Army Tool Set (WP 0168, Item 28)

Cotter Pin (3) (TM 9-2330-381-24P)
 Self-Locking Nut (2) (TM 9-2330-381-24P)
 Bolt (4) (TM 9-2330-381-24P)
 Trunnion Cap (1) (TM 9-2330-381-24P)

Personnel Required

2

Materials/Parts

Hexagon Stock, 1/2 in. (WP 0164, Fig. F-22)
 Cap and Plug Set (WP 0170, Item 4)
 Crocus Cloth, Abrasive (WP 0170, Item 6)
 Grease (WP 0170, Item 16)
 Solvent, Dry Cleaning (WP 0170, Item 32)
 4 in. x 4 in. Wood Blocks (5)
 Mounting Plate (2) (TM 9-2330-381-24P)

Equipment Conditions

Semitrailer parked on level ground, coupled to tractor, or
 if not coupled, wheels chocked
 Platform set at road height (WP 0008)
 Support legs set at 41 in. (104 cm) (WP 0011 and
 WP 0012)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the axle assembly.

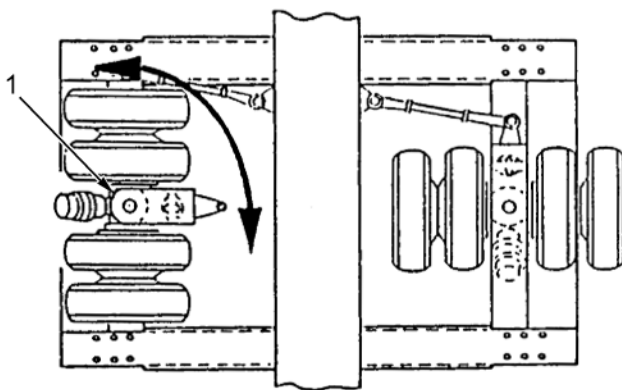
REMOVAL

WARNING

The axle weighs approximately 850 lb (386 kg) with tires and wheels installed. Extreme caution must be used during removal and installation of the axle. Failure to follow this warning may result in injury or death to personnel.

NOTE

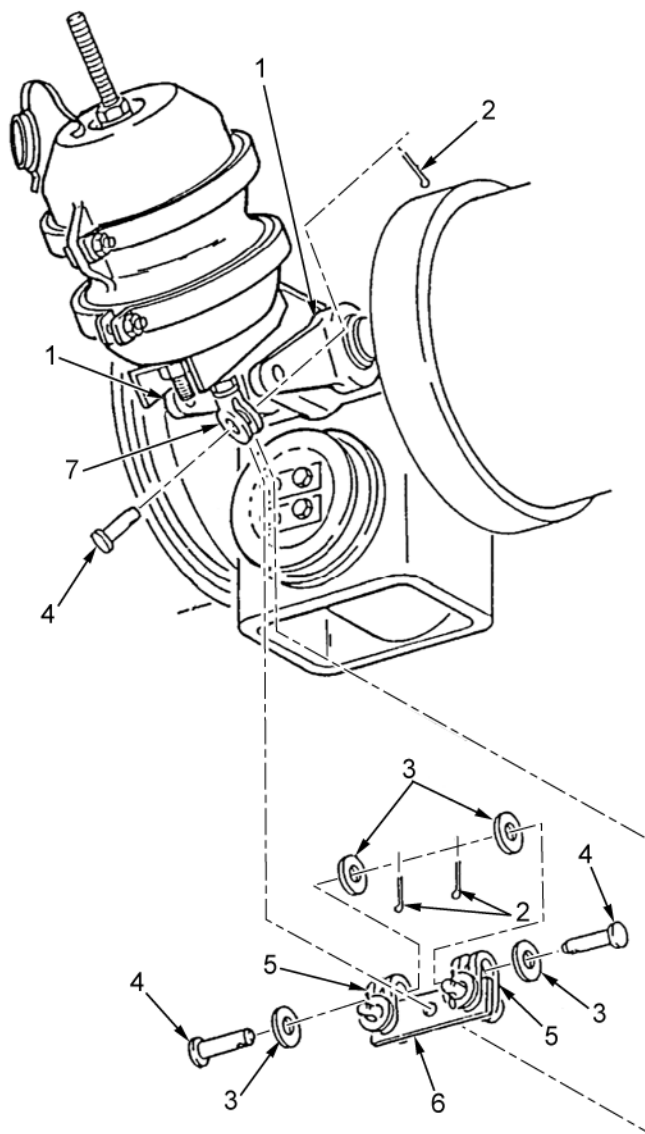
- Removing/installing axles should normally be done with wheels and tires installed for ease of handling. If axle is being removed to perform other maintenance tasks on the axle, it will be necessary to remove wheels and tires after the axle assembly has been separated from the bogie.
 - If axle is being removed to perform ultra bushing maintenance task, it will be necessary to replace trunnion cap.
1. Release semitrailer parking brakes by pushing in brake release valve (WP 0004).
 2. Cage brakes at affected bogie (WP 0023).
 3. Start Auxiliary Power Unit (APU) (WP 0005).
 4. Lower platform until resting on front and rear support legs (WP 0011 and WP 0012).
 5. Close suspension isolation valve for affected bogie with handle facing outward from center of semitrailer (WP 0004).
 6. Raise platform to approximately 45 in. (114.3 cm) (WP 0008) until lower suspension arm spindle on affected bogie appears to be level. Install semitrailer wheel chocks.
 7. Place pieces of 4 in. x 4 in. (10.16 cm x 10.16 cm) wood under each support leg. Lower platform (WP 0008) support legs so that legs are sitting on wood blocks.
 8. Apply parking brakes by pulling out brake release valve (WP 0004). Shut down APU (WP 0005).
 9. Remove upper and lower brake dust shields from affected bogie (WP 0068).
 10. Disconnect connecting link from affected bogie (WP 0082).
 11. Rotate affected bogie (Figure 1, Item 1) inboard as far as practical, ensuring that suspension hydraulic and pneumatic hoses are not under any tension.



HETT0599

Figure 1. Bogie Wheels.

12. Remove three cotter pins (Figure 2, Item 2), four washers (Figure 2, Item 3), three pins (Figure 2, Item 4), and crossbar (Figure 2, Item 6) with two clevises (Figure 2, Item 5) from two slack adjusters (Figure 2, Item 1) and brake chamber clevis (Figure 2, Item 7). Discard cotter pins.



HETT0600

Figure 2. Brake Chamber.

CAUTION

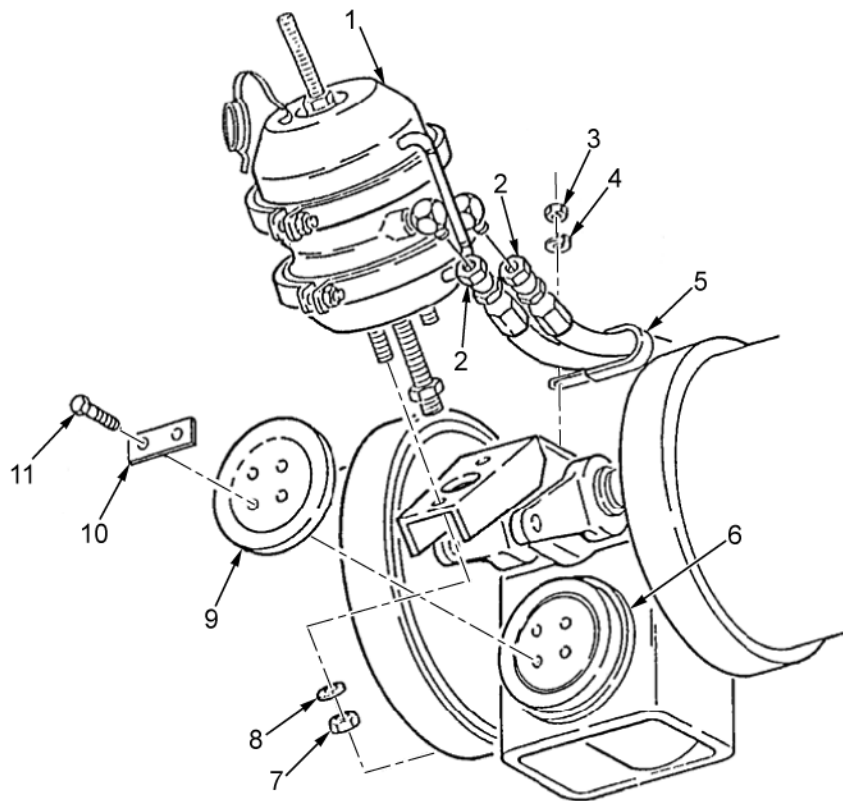
All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or foreign material from entering the pneumatic system or damage to equipment may result.

13. Tag and disconnect two air lines (Figure 3, Item 2) from service/parking brake chamber (Figure 3, Item 1). Install caps/plugs onto fittings and hoses.
14. Remove nut (Figure 3, Item 3), lockwasher (Figure 3, Item 4), and loop clamp (Figure 3, Item 5) from axle. Move two air brake lines (Figure 3, Item 2) inward toward center of semitrailer platform, away from axle.
15. Straighten corners of two mounting plates (Figure 3, Item 10) that lock four bolts (Figure 3, Item 11). Remove four bolts, two mounting plates, and trunnion cap (Figure 3, Item 9) from spindle (Figure 3, Item 6). Discard bolts and mounting plates. Discard cap if defective.

WARNING

Personnel used to remove/maneuver axle or parking brake chamber must not, at any time, use the caging bolt as a holding/lifting device. The caging bolt is held in place by pressure from a spring in the brake chamber. If caging bolt becomes unseated inside brake chamber, serious injury may result. Failure to follow this warning may result in serious injury to personnel.

16. Use 15/16 in. deep-well socket to remove two self-locking nuts (Figure 3, Item 7), two washers (Figure 3, Item 8), and brake chamber (Figure 3, Item 1) from axle. Discard self-locking nuts.



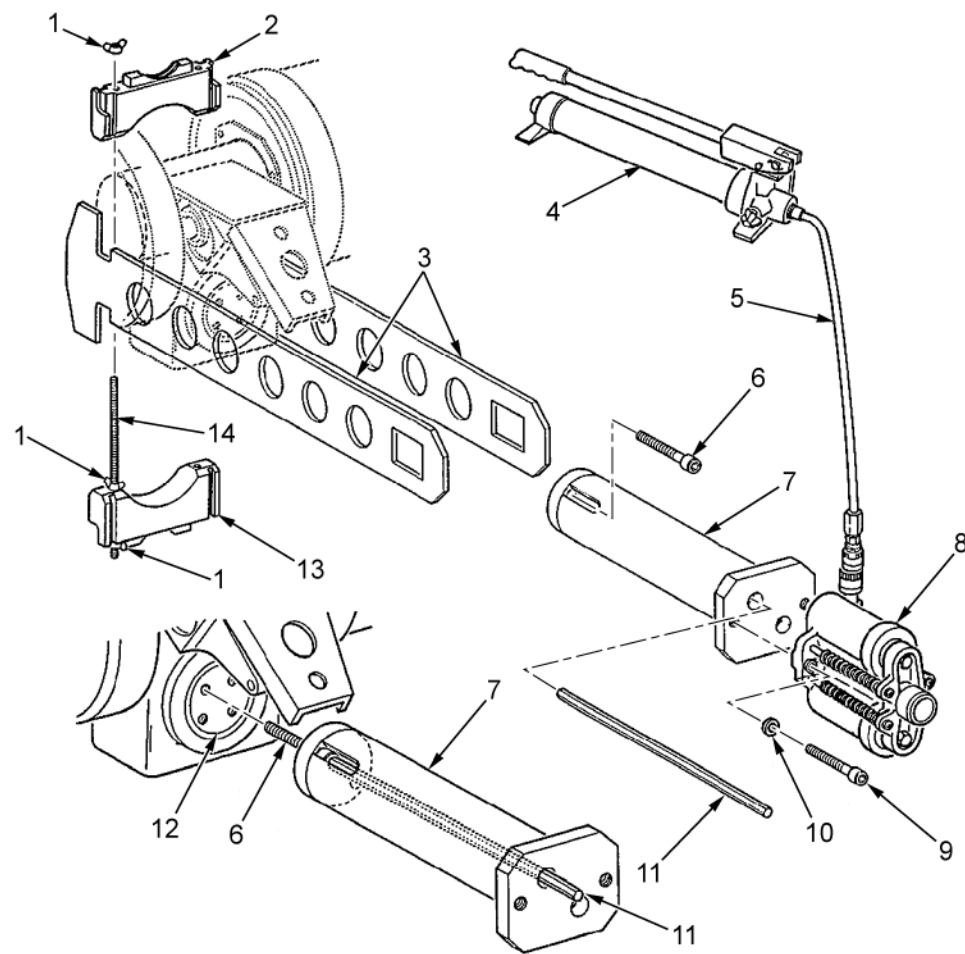
HETT0608

Figure 3. Brake Chamber Removed.

NOTE

The extender must be aligned so that mounting bolt holes in the extender line up with upper left and lower right holes in the spindle. This alignment ensures that the hydraulic ram will be properly mounted.

17. Align extender (Figure 4, Item 7) with upper left and lower right holes on spindle (Figure 4, Item 12). Use one person to hold extender in place and have second person insert 2 5/8 in. long capscREW (Figure 4, Item 6) into extender approximately over bolt hole in spindle.
18. Use 1/2 in. hex stock to pass hex stock (Figure 4, Item 11) through opening in hydraulic ram (Figure 4, Item 8) end of extender (Figure 4, Item 7). Insert hex stock into capscREW (Figure 4, Item 6) and install and tighten first capscREW into upper left mounting hole on spindle. Remove hex stock (Figure 4, Item 11) from extender.
19. Insert another capscREW (Figure 4, Item 6) into opening in side of extender (Figure 4, Item 7) approximately over lower right bolt hole on extender.
20. Pass hex stock (Figure 4, Item 11) through lower right hole in extender (Figure 4, Item 7) and install and tighten second capscREW (Figure 4, Item 6). Remove hex stock.
21. Prepare hydraulic ram (Figure 4, Item 8) as follows:
 - a. Assemble hydraulic hose (Figure 4, Item 5) to hydraulic pump (Figure 4, Item 4).
 - b. Fill hydraulic pump (Figure 4, Item 4) with hydraulic fluid, as required, in accordance with manufacturer's specifications.
 - c. Connect hydraulic hose (Figure 4, Item 5) to hydraulic ram (Figure 4, Item 8).
 - d. Place hydraulic ram (Figure 4, Item 8) on the ground with ram extender (Figure 4, Item 7) facing up.
 - e. Hold hydraulic pump (Figure 4, Item 4) as high as possible without kinking hydraulic hose (Figure 4, Item 5) or lifting hydraulic ram (Figure 4, Item 8) off the ground.
 - f. Operate hydraulic pump (Figure 4, Item 4) until hydraulic ram (Figure 4, Item 8) is fully extended with approximately 3 in. (7.6 cm) of hydraulic ram piston showing.
 - g. Open relief valve on hydraulic pump (Figure 4, Item 4) to allow hydraulic ram (Figure 4, Item 8) to retract. Close relief valve on hydraulic pump.
22. Use two people to align hydraulic ram (Figure 4, Item 8) with hose connection on hydraulic ram pointing upward to extender (Figure 4, Item 7). Secure hydraulic ram to extender by installing two 3 in. long capscREWS (Figure 4, Item 9) and lockwashers (Figure 4, Item 10).
23. Set hydraulic pump (Figure 4, Item 4) on platform over affected bogie to keep hydraulic hose (Figure 4, Item 5) and hydraulic pump out of the way.
24. Install one wingnut (Figure 4, Item 1) onto threaded rod (Figure 4, Item 14) so that approximately three threads of threaded rod are showing. Repeat this step for other threaded rod.
25. Install two threaded rods (Figure 4, Item 14) into tie bar (Figure 4, Item 13) as shown on illustration. Once both threaded rods are in place, secure by installing two wingnuts (Figure 4, Item 1) flush against tie bar. These assembled parts create the lower tie bar.
26. Place two side plates (Figure 4, Item 3) flat on the ground. Push first side plate, T-end first, under axle. Once under axle, rotate side plate vertically next to left-hand brake drum. Push second side plate under axle and rotate vertically next to right-hand brake drum.
27. Use one person to lift both side plates (Figure 4, Item 3), and have second person align and install lower tie bar (Figure 4, Item 13) into place between both side plates.
28. While still holding both side plates (Figure 4, Item 3) upward, align and install upper tie bar (Figure 4, Item 2) over two threaded rods (Figure 4, Item 14) and into slots in both side plates.
29. Secure upper tie bar (Figure 4, Item 2) in place by installing two wingnuts (Figure 4, Item 1) onto threaded rods (Figure 4, Item 14).



HETT0602

Figure 4. Upper Tie Bar.

30. Install detent pin (Figure 5, Item 8) into adjustment rod (Figure 5, Item 7). Thread adjustment rod, pin end of rod on same side as slotted end of thrust bar (Figure 5, Item 6), so that approximately 12 in. (30 cm) (Figure 5, Item 5) of adjustment rod sticks out of flat side of thrust bar.
31. Install hex nut (Figure 5, Item 13) onto adjustment rod (Figure 5, Item 7). Loosely tighten hex nut against flat side of thrust bar (Figure 5, Item 6).
32. Install hex nut end of adjustment rod (Figure 5, Item 7) into hydraulic ram (Figure 5, Item 3). Push adjustment rod all the way into hydraulic ram.
33. Use two people to lift upward on both side plates (Figure 5, Item 4) so that square cutout is approximately aligned with thrust bar (Figure 5, Item 6). Then, maneuver side plates, as required, so that thrust bar mounts into both side plates. Ensure groove in thrust bar is properly seated in each square cutout in both side plates.
34. While holding side plates (Figure 5, Item 4) parallel to hydraulic ram (Figure 5, Item 3) and extender (Figure 5, Item 2), tighten hex nut (Figure 5, Item 13) against hydraulic ram until snug.
35. Position one person under platform in front of affected bogie. Place a 4 in. x 4 in. (10.16 cm x 10.16 cm) block of wood (Figure 5, Item 10) on the ground directly under suspension cylinder on affected bogie. Place chisel end of crowbar (Figure 5, Item 11) under lower tie bar (Figure 5, Item 9) and rest crowbar on block of wood.

CAUTION

The upper and lower tie bars must be manually centered over ultra bushing using a crowbar, or a misalignment may occur and damage to equipment may result.

36. Use one person to pull down on crowbar (Figure 5, Item 11) and align both upper and lower tie bars (Figure 5, Item 9 and Item 12) over ultra bushing/spindle. While holding up both tie bars with crowbar, hand-tighten hex nut (Figure 5, Item 13) firmly against hydraulic ram (Figure 5, Item 3) as snug as possible.

NOTE

If ultra bushing separates/tears in half during removal, continue procedure. Ultra bushing inner race may be removed after axle removal is completed.

37. Operate hydraulic pump (Figure 5, Item 1) until axle moves the full 3 in. (7.6 cm) stroke of hydraulic ram (Figure 5, Item 3).
38. Relieve pressure in hydraulic pump (Figure 5, Item 1) and screw threaded rod (Figure 5, Item 7) through thrust bar (Figure 5, Item 6) until hex nut (Figure 5, Item 13) is firm against hydraulic ram (Figure 5, Item 3). Lift tie bars (Figure 5, Item 9 and Item 12) and hand-tighten hex nut to maintain alignment.
39. Again operate hydraulic pump (Figure 5, Item 1) until axle moves the full 3 in. stroke of hydraulic ram (Figure 5, Item 3).

NOTE

Use one person to continue to jam the hex nut against the hydraulic ram as the ram cylinders compress. This will keep the axle puller tight against the axle to prevent having to align the upper and lower tie bars.

40. Use one person to continue to thread hex nut (Figure 5, Item 13) against hydraulic ram (Figure 5, Item 3), and have second person slowly relieve pressure in hydraulic pump (Figure 5, Item 1) until hydraulic ram is completely retracted.
41. Remove wood block (Figure 5, Item 10) and crowbar (Figure 5, Item 11) from under affected bogie. Position hydraulic floor jack beneath lower suspension arm to maintain height of spindle parallel to the ground when axle is pulled clear of spindle.

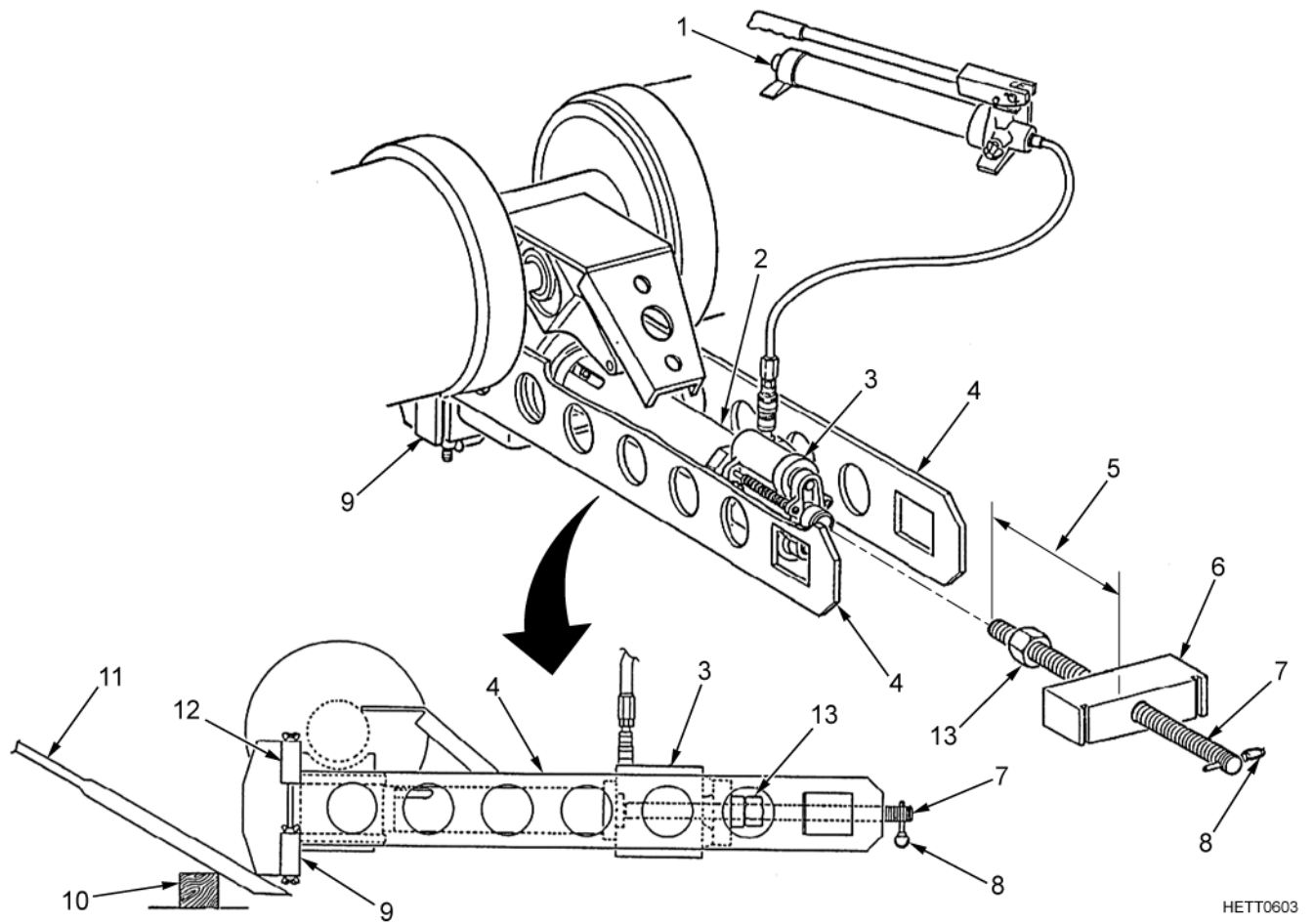
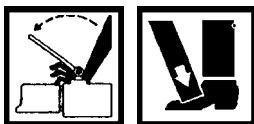


Figure 5. Hydraulic Pump and Hydraulic Ram.

WARNING

Once ultra bushing is clear of spindle, side plates may separate from thrust bar, allowing either side plates or thrust bar to fall to ground. Keep hands and feet clear of area. Failure to follow this warning may result in injury to personnel.

NOTE

This operation takes slightly less than three ram strokes. Stroke of hydraulic ram is 3 in. (7.62 cm) and length of ultra bushing is 8 in. (20.32 cm).

42. Repeat steps 37 thru 40 until ultra bushing is clear of spindle (Figure 6, Item 3) and axle is completely on extender (Figure 6, Item 15). Relieve pressure on hydraulic pump until hydraulic ram (Figure 6, Item 6) is fully retracted.
43. Use two people to spread ends of two side plates (Figure 6, Item 14) and to unseat and remove thrust bar (Figure 6, Item 9). Unscrew and remove hex nut (Figure 6, Item 11) and adjustment rod (Figure 6, Item 10) from thrust bar. Remove detent pin (Figure 6, Item 8) from adjustment rod.
44. Roll axle away from work area.
45. Use two people and hex stock (Figure 6, Item 4) to remove two capscrews (Figure 6, Item 7), lockwashers (Figure 6, Item 16), and hydraulic ram (Figure 6, Item 6) from extender (Figure 6, Item 15).
46. Use hex stock (Figure 6, Item 4) to remove two capscrews (Figure 6, Item 5) and extender (Figure 6, Item 15) from spindle (Figure 6, Item 3). Remove extender from within axle.
47. Use two people to remove two wingnuts (Figure 6, Item 1), upper tie bar (Figure 6, Item 2), lower tie bar (Figure 6, Item 12), and two side plates (Figure 6, Item 14) from axle. Remove four wingnuts and two threaded rods (Figure 6, Item 13) from lower tie bar.

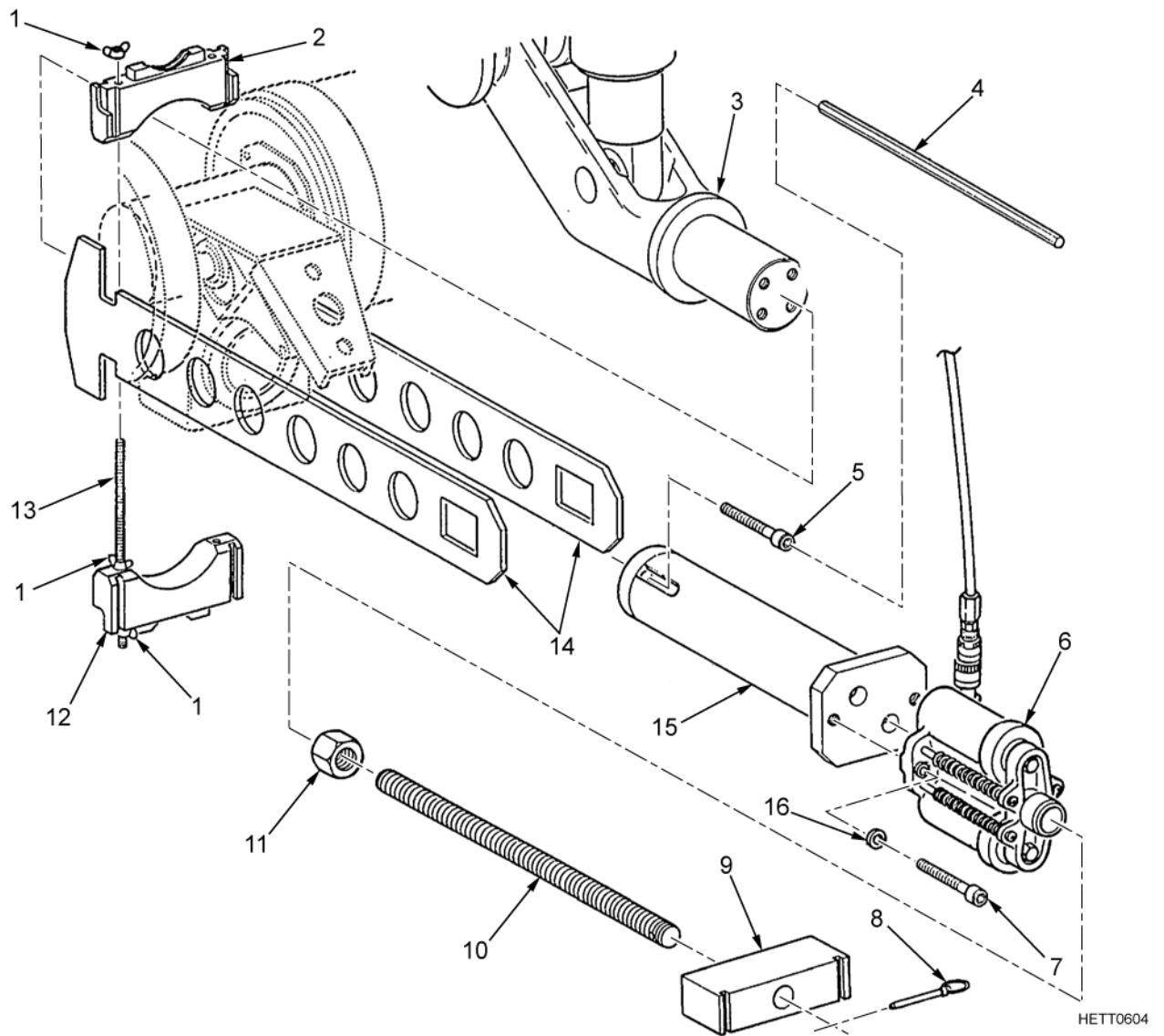
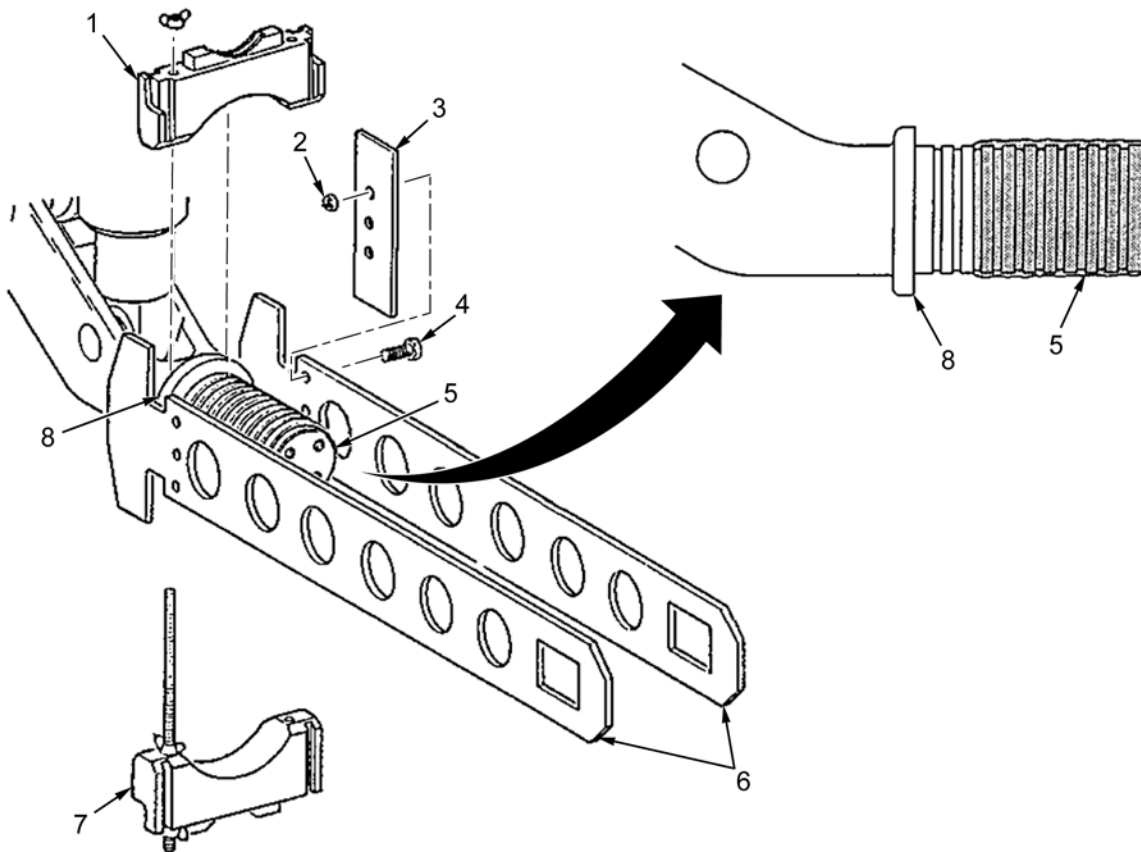


Figure 6. Hydraulic Pump and Hydraulic Ram Removed.

48. If, during removal procedure, the ultra bushing tore/separated and inner race (Figure 7, Item 5) remained on spindle (Figure 7, Item 8), proceed as follows:
- On inner race (Figure 7, Item 5) clean two grooves that are closest to suspension cylinder.
 - Install two side bars (Figure 7, Item 3) on two side plates (Figure 7, Item 6) using three bolts (Figure 7, Item 4) and nuts (Figure 7, Item 2) on each one.
 - Reinstall axle puller parts with upper and lower tie bars (Figure 7, Item 1 and Item 7) inverted, flipped over 180 degrees, engaging two cleaned grooves. Repeat steps 17 thru 47, as required, to remove inner race (Figure 7, Item 5) from spindle (Figure 7, Item 8).



HETT0605

Figure 7. Axle.

WARNING**SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
- The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound.
- Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.

Failure to follow these warnings may result in injury or death to personnel.

49. Inspect axle and parking/service brake chamber bracket for broken welds, broken casting, bends, or excessive corrosion. Clean corrosion with dry cleaning solvent and rags. Replace defective parts, as required.
50. Inspect lower suspension arm spindle, spindle cap, and ultra bushing bore for nicks, burrs, scratches, scoring, and corrosion. Clean with dry cleaning solvent and rags. If defects are found, use a fine grade of crocus cloth to polish spindle.
51. Check ultra bushing bore for grooves, scratches, corrosion, cracks, or unusual wear. Hone bushing, if necessary, to restore interior finish.

END OF TASK

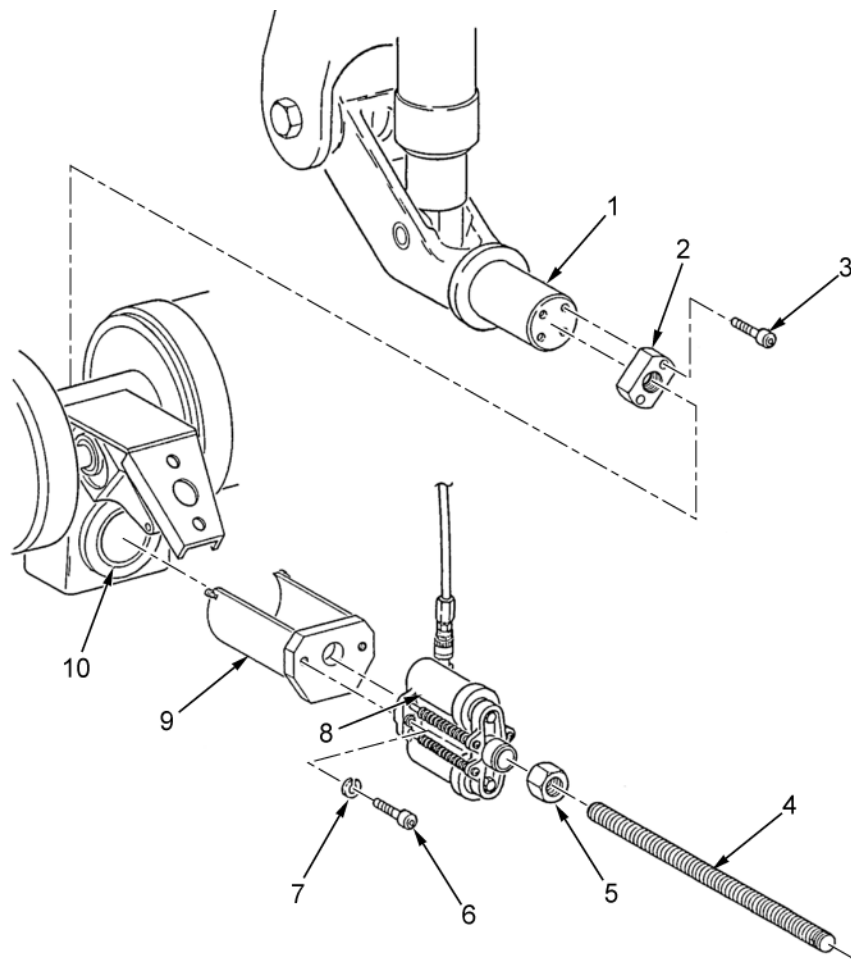
INSTALLATION

1. If not already done, install all wheels and tires on axle assembly (WP 0081, WP 0080, WP 0079, and WP 0078).
2. Install trunnion fitting (Figure 8, Item 2) onto spindle (Figure 8, Item 1) using two socket head bolts (Figure 8, Item 3).
3. Check that spindle (Figure 8, Item 1) is parallel to the ground. Make any required adjustments to hydraulic floor jack. If ultra bushing is new, remove anticorrosion material from inner bore. Apply grease to entire surface of ultra bushing inner bore and lower suspension arm spindle.
4. Use two people to roll axle assembly in place over spindle (Figure 8, Item 1).
5. Align spindle (Figure 8, Item 1) with ultra bushing (Figure 8, Item 10) until end of spindle starts into end of ultra bushing.
6. Screw adjustment rod (Figure 8, Item 4) onto trunnion fitting (Figure 8, Item 2) until it bottoms out against spindle (Figure 8, Item 1).
7. Assemble spacer (Figure 8, Item 9) onto base of hydraulic ram (Figure 8, Item 8) using two lockwashers (Figure 8, Item 7) and capscrews (Figure 8, Item 6).
8. Install spacer (Figure 8, Item 9), hydraulic ram (Figure 8, Item 8), and hex nut (Figure 8, Item 5) onto adjustment rod (Figure 8, Item 4). Hand-tighten hex nut to remove slack.

CAUTION

Be sure ultra bushing and spindle are properly aligned or damage to equipment may result.

9. Operate hydraulic hand pump until hydraulic ram (Figure 8, Item 8) extends to its full travel of 3 in. (7.62 cm).
10. Release pressure on hydraulic hand pump and allow hydraulic ram (Figure 8, Item 8) to relax to retracted position. Hand-tighten hex nut (Figure 8, Item 5) to remove slack.
11. Repeat steps 9 and 10 until ultra bushing (Figure 8, Item 10) is fully onto spindle.



HETT0606

Figure 8. Bushing, Spindle, and Press.

12. Release pressure on hydraulic hand pump and allow hydraulic ram (Figure 9, Item 3) to relax to retracted position. Remove hex nut (Figure 9, Item 4) and hydraulic ram from adjustment rod (Figure 9, Item 1).
13. Remove two capscrews (Figure 9, Item 5), lockwashers (Figure 9, Item 6), and spacer (Figure 9, Item 2) from hydraulic ram (Figure 9, Item 3).
14. Remove adjustment rod (Figure 9, Item 1), two capscrews (Figure 9, Item 7), and trunnion fitting (Figure 9, Item 8) from spindle (Figure 9, Item 9).

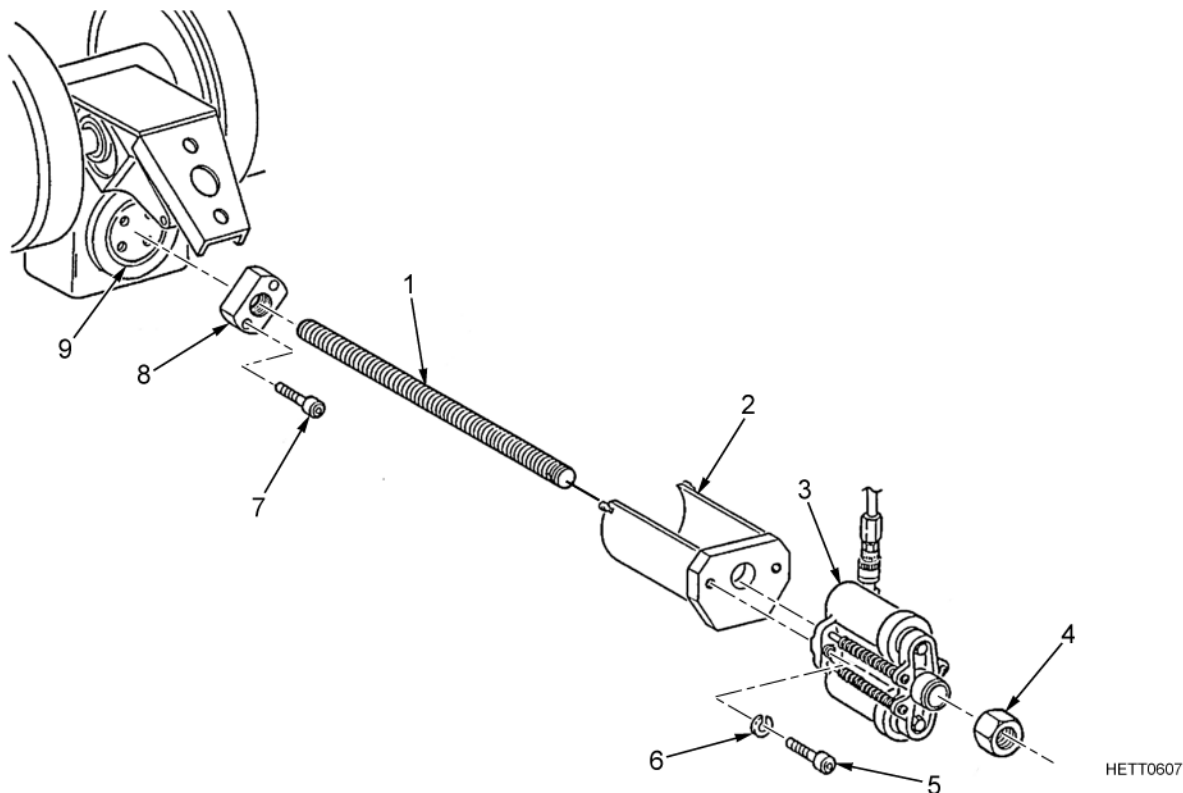


Figure 9. Trunnion and Press.

WARNING

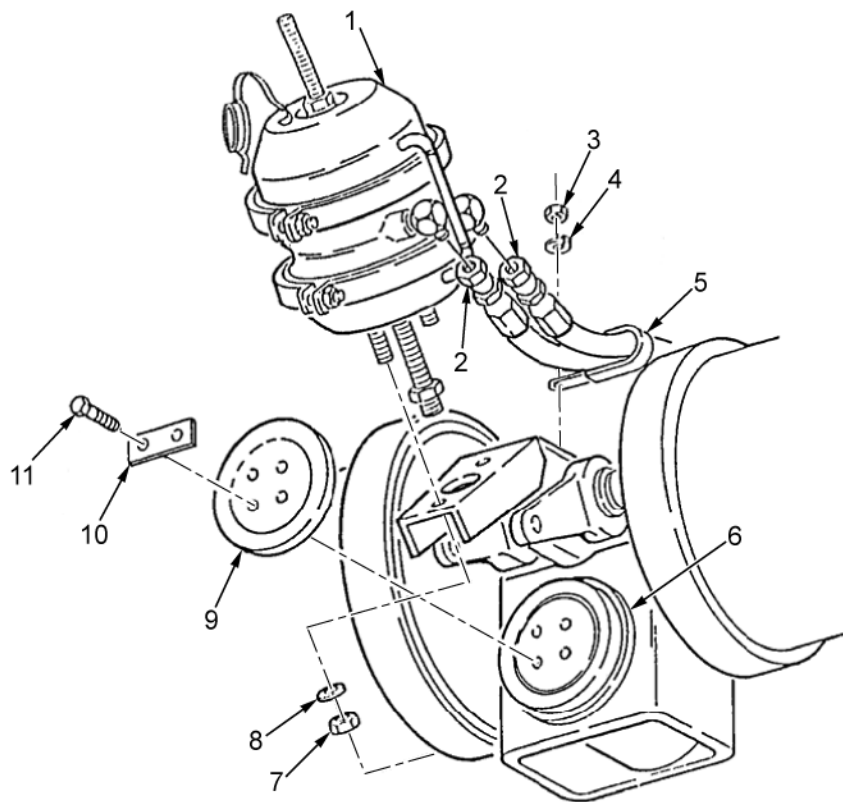
Person supporting parking/service brake chamber on axle must not at any time use caging bolt as a holding device. The caging bolt is held in place by pressure from spring in brake chamber. If caging bolt becomes unseated inside brake chamber, serious injury may result. Failure to follow this warning may result in serious injury to personnel.

15. Install brake chamber (Figure 10, Item 1). Secure brake chamber using a 15/16 in. deep-well socket, two washers (Figure 10, Item 8), and two nuts (Figure 10, Item 7).

NOTE

Bend ends of mounting plates up slightly before installation. Otherwise, they will be very difficult to bend.

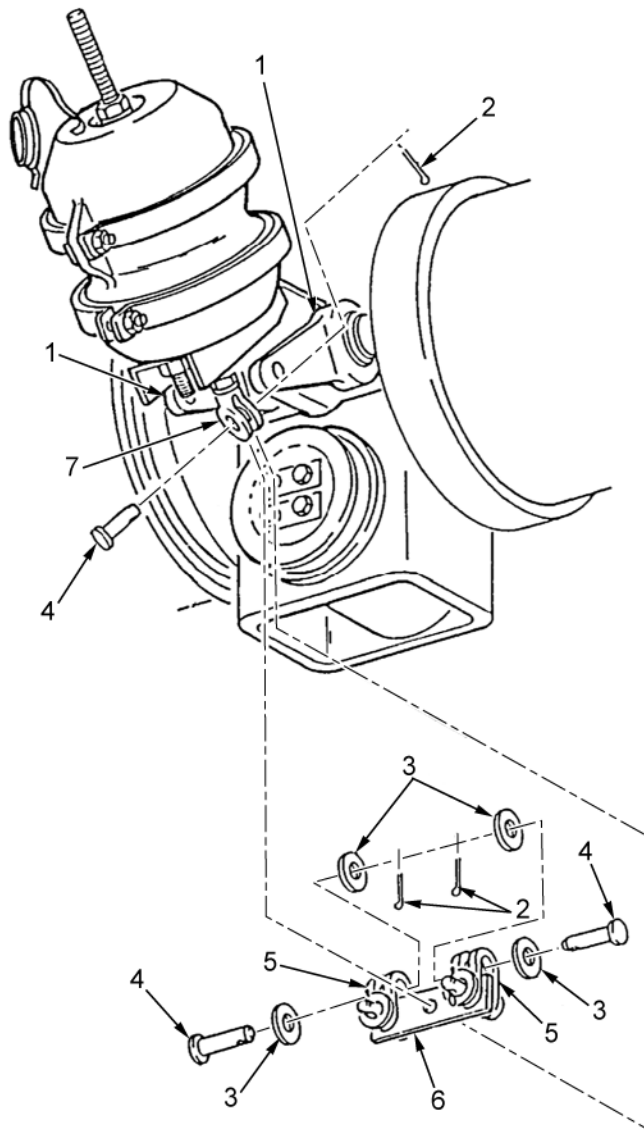
16. Install trunnion cap (Figure 10, Item 9) and two mounting plates (Figure 10, Item 10) on spindle (Figure 10, Item 6). Secure with four bolts (Figure 10, Item 11). Use a torque wrench to torque bolts to 240 lb-ft (325 Nm) and bend one corner of each end of mounting plate up against flats of bolt heads.
17. Reposition two air brake lines (Figure 10, Item 2) and secure to axle with loop clamp (Figure 10, Item 5), lockwasher (Figure 10, Item 4), and nut (Figure 10, Item 3).
18. Remove caps/plugs and connect two air lines (Figure 10, Item 2) to brake chamber (Figure 10, Item 1).



HETT0608

Figure 10. Brake Chamber Removed.

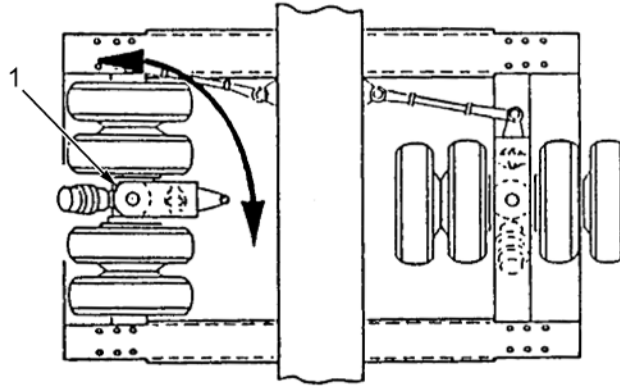
19. Install crossbar (Figure 11, Item 6) with two clevises (Figure 11, Item 5) to two slack adjusters (Figure 11, Item 1) and brake chamber clevis (Figure 11, Item 7) with three pins (Figure 11, Item 4), four washers (Figure 11, Item 3), and three cotter pins (Figure 11, Item 2).
20. Install upper and lower brake dust shields (WP 0068).



HETT0600

Figure 11. Brake Chamber Installed.

21. Rotate bogie (Figure 12, Item 1) into normal position. Connect connecting link to bogie (WP 0076).
22. Open suspension isolation valve with handle facing toward front of semitrailer (WP 0004) and start APU (WP 0005).
23. Couple semitrailer to tractor and charge semitrailer air brake system (WP 0013). Release parking brakes by pushing in brake release valve (WP 0004), and then apply parking brakes by pulling out brake release valve. Uncage brakes and restow caging bolt (WP 0023).
24. Adjust platform to road height (WP 0008).
25. Stow front and rear support legs (WP 0011 and WP 0012) back on semitrailer.



HETT0599

Figure 12. Bogie Wheels.

END OF TASK**FOLLOW-ON MAINTENANCE**

Adjust brakes as required (WP 0037).

END OF WORK PACKAGE

FIELD MAINTENANCE**ULTRA BUSHING**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Kit, Ultra Bushing Rem/Instl (WP 0168, Item 19)
Ram, Hyd, 50 Ton Portable (WP 0168, Item 24)
Ram, Hyd, 30 Ton Portable (WP 0168, Item 27)
Standard Army Tool Set (WP 0168, Item 28)

Cotter Pin (3)

Personnel Required

2

Equipment Conditions

Axle removed from semitrailer (WP 0150)
Wheels removed from axle (WP 0078, WP 0079,
WP 0080, and WP 0081)

Materials/Parts

Crocus Cloth, Abrasive (WP 0170, Item 6)
Grease, Automotive and Artillery (WP 0170, Item 16)

GENERAL INFORMATION

This work package contains instructions for the removal, inspection, and installation of the ultra bushing.

REMOVAL**WARNING**

Do not hold caging bolt or injury to personnel may result.

CAUTION

Do not allow caging bolt to rest or fall to the ground or damage to equipment may result.

1. Position axle with end of brake chamber on pieces of wood so that ultra bushing is as parallel to the ground as possible and caging bolt does not rest on the ground.
2. Chock axle front and back using pieces of wood.

NOTE

The pin on the brake chamber clevis is shorter than the other two pins.

3. Remove three cotter pins (Figure 1, Item 4), six washers (Figure 1, Item 2), two pins (Figure 1, Item 1), pin (Figure 1, Item 5), and crossbar (Figure 1, Item 3) from two slack adjusters (Figure 1, Item 8) and brake chamber clevis (Figure 1, Item 6). Discard cotter pins.
4. Cage brakes (WP 0023) to move brake chamber clevis (Figure 1, Item 6) out of the way.

CAUTION

Do not allow jam nut to move or brakes will be out of adjustment and damage to equipment may result.

5. While holding jam nut (Figure 1, Item 7) in place, remove brake chamber clevis (Figure 1, Item 6).

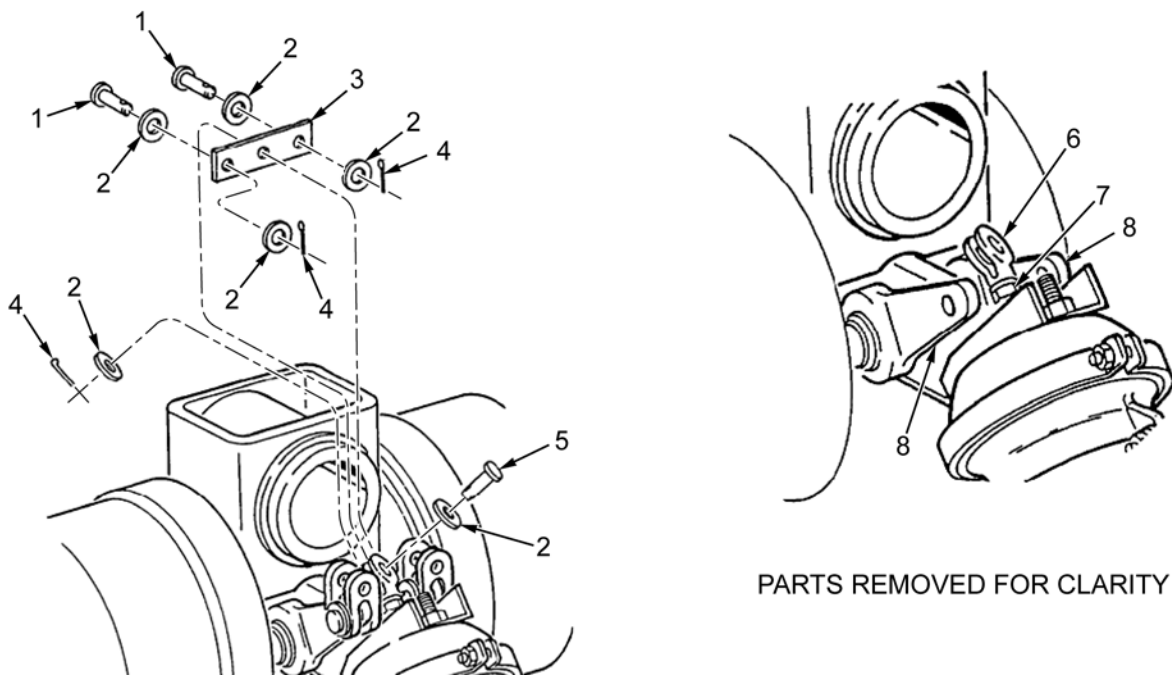


Figure 1. Brake Chamber Pin.

6. Fit puller (Figure 2, Item 1) into place over end of ultra bushing housing (Figure 2, Item 2) on same side as brake chamber. Insert shaft (Figure 2, Item 5), short threaded end first, through ultra bushing housing and ultra bushing (Figure 2, Item 3) from side opposite brake chamber, and thread into puller.
7. Tighten puller (Figure 2, Item 1) onto shaft (Figure 2, Item 5) until puller bottoms out. At least one full thread should be showing.
8. Fit canister (Figure 2, Item 4) over shaft (Figure 2, Item 5) onto ultra bushing housing (Figure 2, Item 2) on side opposite brake chamber.

NOTE

The 50-ton hydraulic ram must be used to remove the ultra bushing because additional pressure is required to break the ultra bushing free.

9. Install 50-ton hydraulic ram (Figure 2, Item 6) and adjuster (Figure 2, Item 7) onto shaft (Figure 2, Item 5). Ensure puller (Figure 2, Item 1) is seated squarely in bore of ultra bushing (Figure 2, Item 3) and canister (Figure 2, Item 4) is seated squarely on ultra bushing housing (Figure 2, Item 2). Hand-tighten adjuster snugly against the hydraulic ram.

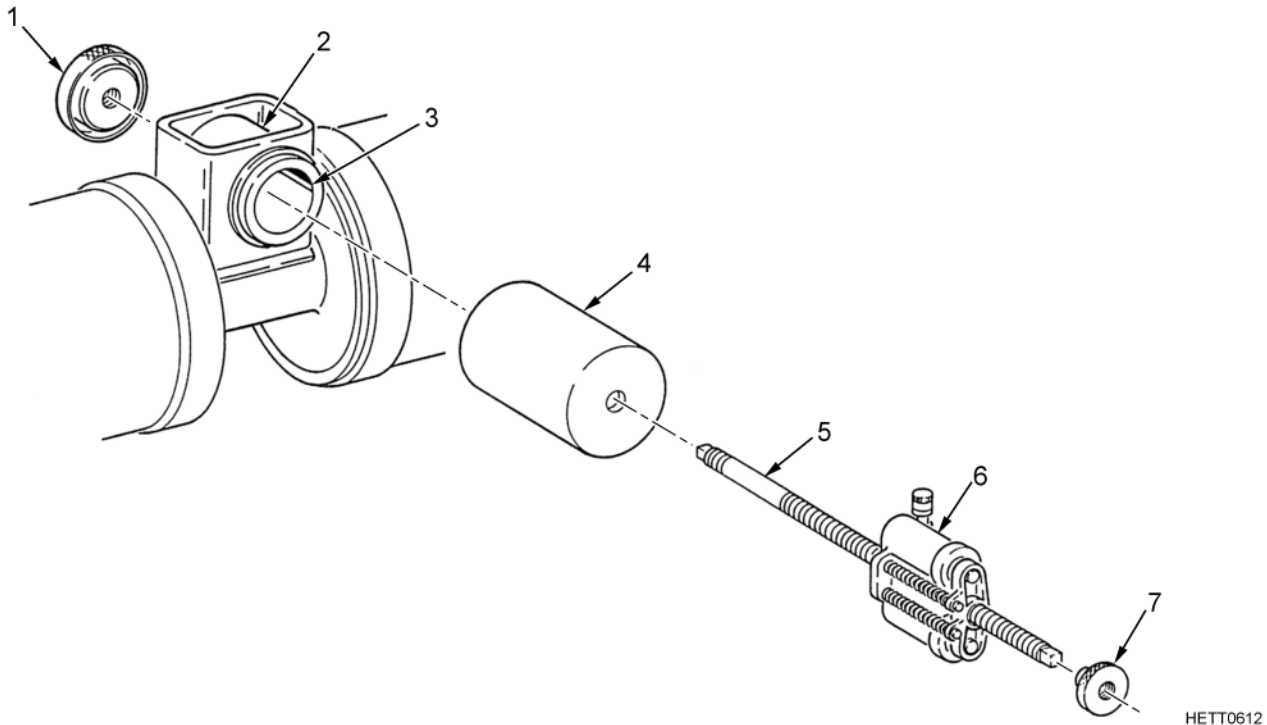
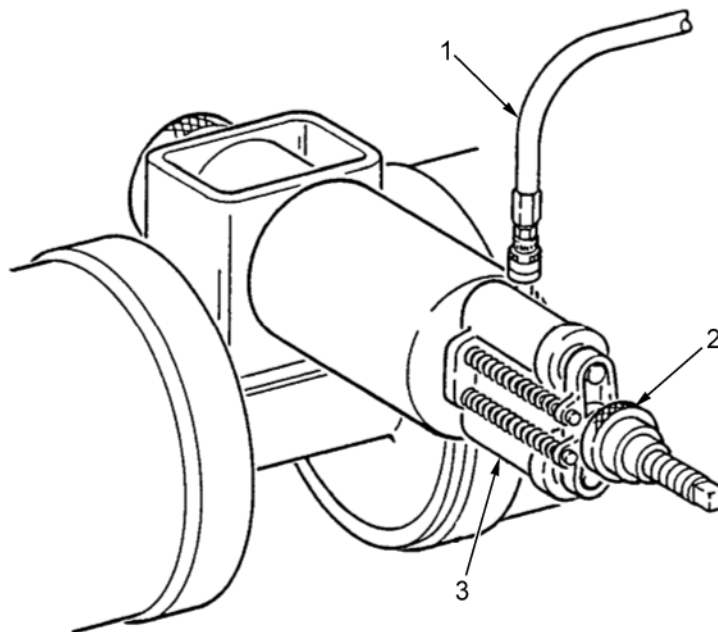


Figure 2. Puller.

WARNING

Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into the eyes, flush them immediately with water and seek medical attention. If hydraulic fluid gets on skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking. Failure to follow this warning may result in injury or death to personnel.

10. Connect hydraulic power source (Figure 3, Item 1) to hydraulic ram (Figure 3, Item 3) and apply pressure until hydraulic ram extends full stroke. Recheck all tools for proper seating and alignment.
11. Relieve hydraulic pressure and let return springs retract ram. Tighten adjuster (Figure 3, Item 2) against hydraulic ram (Figure 3, Item 3) and apply hydraulic pressure.



HETT0613

Figure 3. Ram Installed.

WARNING

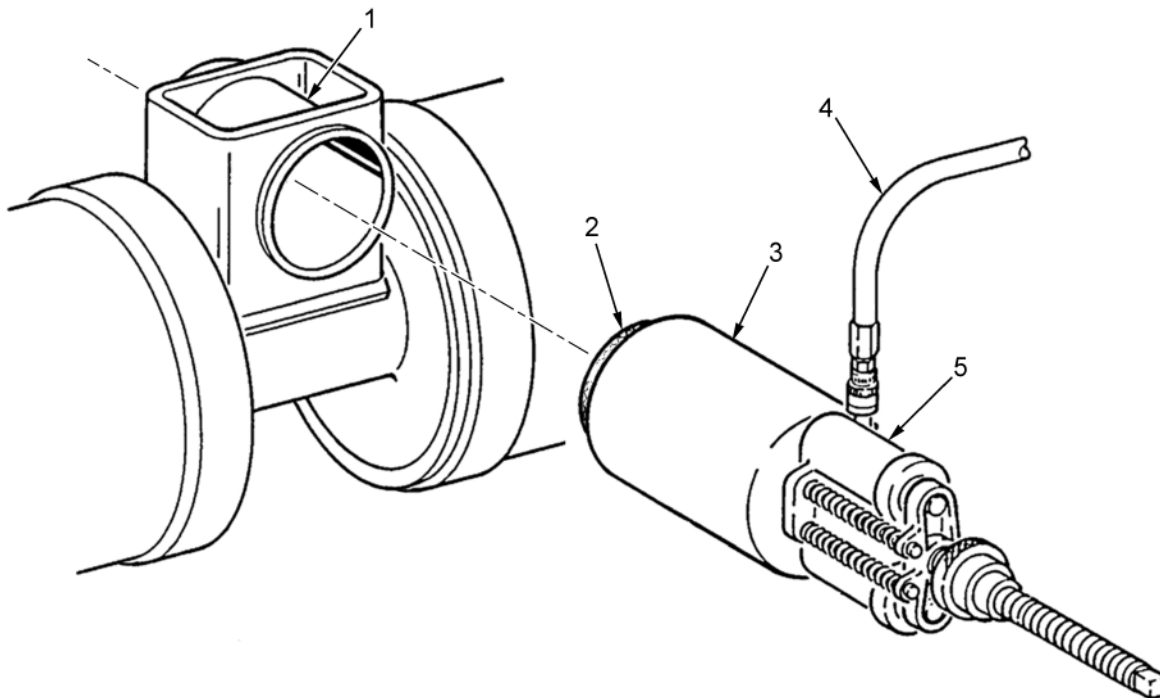
Combined weight of canister, shaft, puller, ultra bushing, and hydraulic ram requires two persons. Canister may fall off of axle after third ram stroke. DO NOT allow end of shaft to scratch interior bore of ultra bushing housing. Be prepared and use two persons or injury to personnel and damage to equipment may result.

12. Repeat step 11 as necessary (approximately three times) until ultra bushing (Figure 4, Item 2) is completely clear of housing (Figure 4, Item 1) and is in side canister (Figure 4, Item 3).
13. Use two persons to firmly hold canister (Figure 4, Item 3) and tap lightly to loosen canister from housing (Figure 4, Item 1). Carefully lower canister to the ground.

WARNING

Residual pressure may remain in hydraulic lines. Open fittings slowly and use caution when disconnecting power source from hydraulic ram or injury to personnel may result. Failure to follow this warning may result in injury or death to personnel.

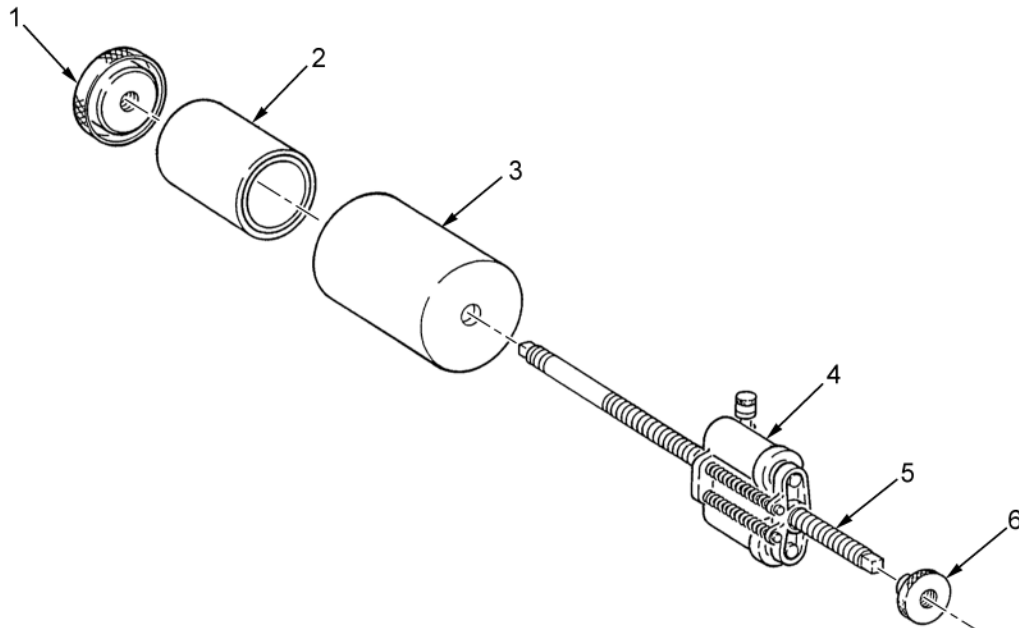
14. Disconnect hydraulic power source (Figure 4, Item 4) from hydraulic ram (Figure 4, Item 5).



HETT0614

Figure 4. Ultra Bushing Removed.

15. Remove adjuster (Figure 5, Item 6), hydraulic ram (Figure 5, Item 4), and canister (Figure 5, Item 3) from shaft (Figure 5, Item 5). Remove puller (Figure 5, Item 1) from shaft. Remove ultra bushing (Figure 5, Item 2) from canister.



HETT0615

Figure 5. Ultra Bushing and Hydraulic Tool.

END OF TASK

INSPECTION

1. Check axle bore and ultra bushing exterior and interior for grooves, scratches, corrosion, cracks, or unusual wear.
2. If necessary, use a fine grade of crocus cloth to polish and restore surface finish.
3. Replace ultra bushing as necessary.

END OF TASK

INSTALLATION

1. Apply grease to inside of housing (Figure 6, Item 3) and outside of ultra bushing (Figure 6, Item 2).

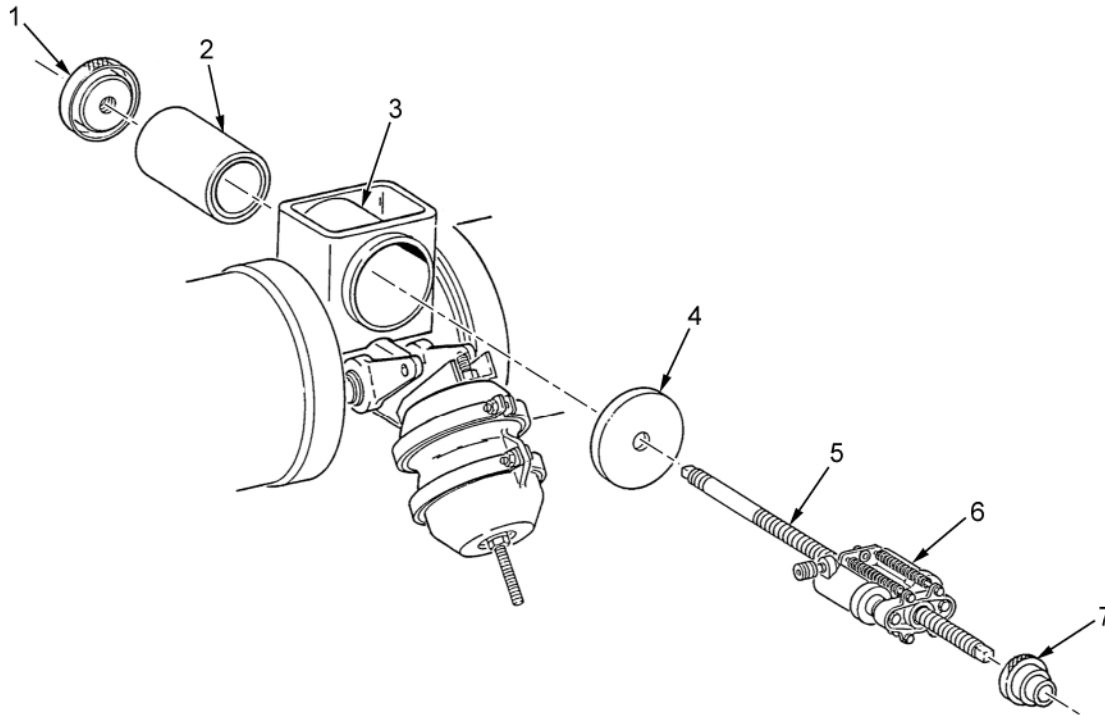
NOTE

Grooved side of backing plate fits over ultra bushing housing; hydraulic ram will snug up to smooth side.

2. Position backing plate (Figure 6, Item 4) onto brake chamber end of ultra bushing housing (Figure 6, Item 3).
3. Insert short threaded end of shaft (Figure 6, Item 5) through backing plate (Figure 6, Item 4) and ultra bushing housing (Figure 6, Item 3) on brake chamber side of axle.
4. Position ultra bushing (Figure 6, Item 2) and puller (Figure 6, Item 1) on ultra bushing housing (Figure 6, Item 3) opposite brake chamber, and thread puller on short threaded end of shaft (Figure 6, Item 5) until it bottoms out. At least one thread should be showing.

CAUTION

- Use only the 30-ton hydraulic ram for installing the ultra bushing. The 50-ton ram is too large and may damage the brake chamber and mounting bracket.
 - The 30-ton hydraulic ram must be turned parallel to the ground or the hydraulic ram will damage the brake chamber bracket.
5. Install 30-ton hydraulic ram (Figure 6, Item 6) and adjuster (Figure 6, Item 7) onto long threaded end of shaft (Figure 6, Item 5).



HETT0616

Figure 6. Ultra Bushing/Press Installation.

CAUTION

Be sure ultra bushing and hydraulic ram are squarely aligned with housing to avoid damage to equipment.

6. Tighten adjuster (Figure 7, Item 4) until entire assembly is snug. Be sure ultra bushing (Figure 7, Item 1) and hydraulic ram (Figure 7, Item 3) are squarely aligned with ultra bushing housing (Figure 7, Item 2).

WARNING

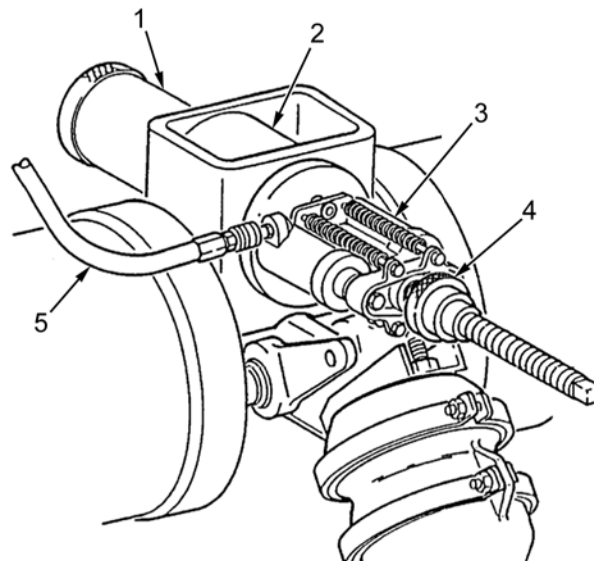
Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets into the eyes, flush them immediately with water and seek medical attention. If hydraulic fluid gets on skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking. Failure to follow this warning may result in injury or death to personnel.

7. Connect hydraulic power source (Figure 7, Item 5) to hydraulic ram (Figure 7, Item 3).

WARNING

Adjuster will be very close to brake chamber bracket. Keep fingers clear of adjuster and brake chamber bracket. Failure to follow this warning may result in injury or death to personnel.

8. Gradually apply hydraulic pressure to hydraulic ram (Figure 7, Item 3) until ultra bushing (Figure 7, Item 1) just starts into housing (Figure 7, Item 2). Stop ram and recheck fixture alignment and interference between hydraulic ram and brake chamber bracket. If not aligned properly, release hydraulic pressure and adjust fixtures. Apply pressure until hydraulic ram has extended full stroke.



HETT0617

Figure 7. Ultra Bushing/Press Installation.

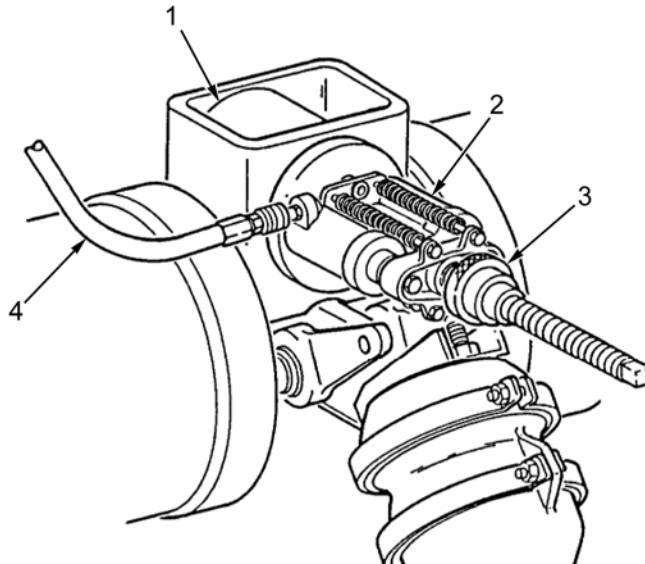
9. Relieve pressure and allow return springs to retract ram (Figure 8, Item 2). Tighten adjuster (Figure 8, Item 3) until snug. Reapply pressure until ram extends full stroke. Repeat as required (approximately three times) until ram bottoms out and ultra bushing is centered in ultra bushing housing (Figure 8, Item 1).

WARNING



Residual pressure may remain in hydraulic lines. Open fittings slowly and use caution when disconnecting power source from hydraulic ram. Failure to follow this warning may result in injury or death to personnel.

10. Disconnect hydraulic power source (Figure 8, Item 4) from hydraulic ram (Figure 8, Item 2).



HETT0618

Figure 8. Ultra Bushing/Press.

CAUTION

Do not allow shaft to scratch inside bore of ultra bushing or premature failure or damage to equipment may result.

11. Remove puller (Figure 9, Item 1) and adjuster (Figure 9, Item 6) from shaft (Figure 9, Item 4). Remove hydraulic ram (Figure 9, Item 5), backing plate (Figure 9, Item 3), and shaft from ultra bushing housing (Figure 9, Item 2).

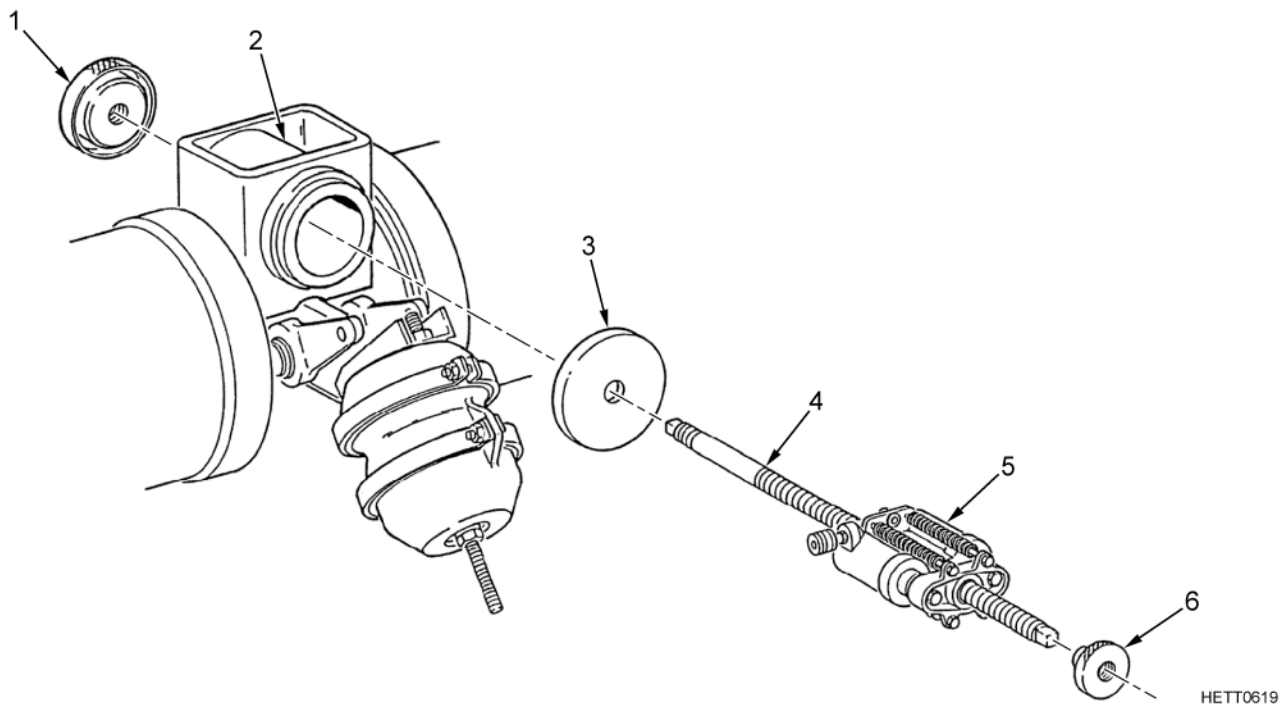


Figure 9. Ultra Bushing Installation, Tool and Housing.

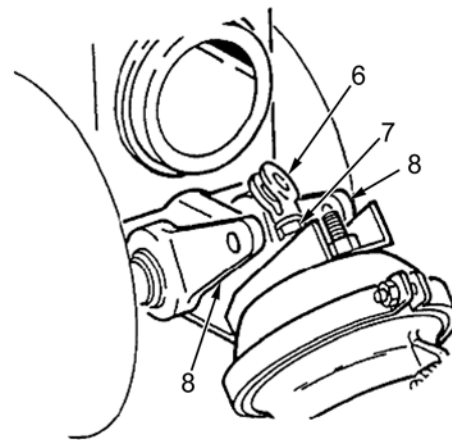
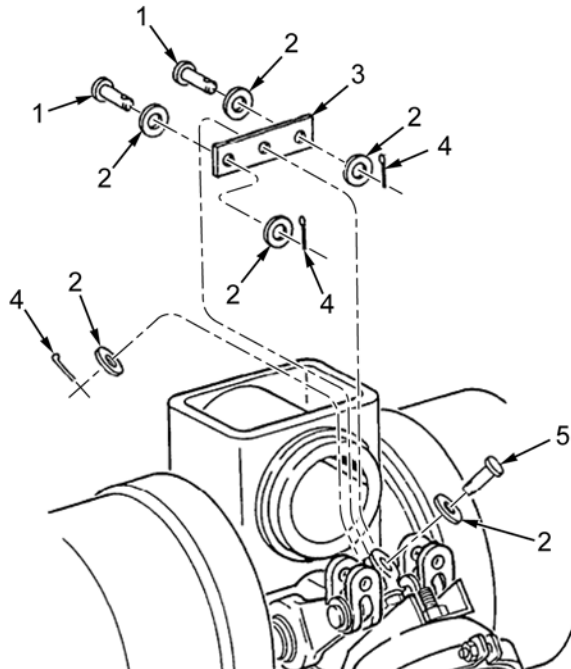
12. While holding jam nut (Figure 10, Item 7), install and tighten brake chamber clevis (Figure 10, Item 6).

NOTE

The brake chamber clevis pin is shorter than the other two pins.

13. Install crossbar (Figure 10, Item 3) on two slack adjusters (Figure 10, Item 8) and brake chamber clevis (Figure 10, Item 6) and secure with pin (Figure 10, Item 5), two pins (Figure 10, Item 1), six washers (Figure 10, Item 2), and three cotter pins (Figure 10, Item 4).

14. Uncage brakes (WP 0023).



PARTS REMOVED FOR CLARITY

HETT0611

Figure 10. Brake Chamber Bracket.

END OF TASK

FOLLOW-ON MAINTENANCE

Install axle (WP 0150).

Install wheels (WP 0078, WP 0079, WP 0080, WP 0081).

Adjust brakes (WP 0068).

END OF WORK PACKAGE

FIELD MAINTENANCE**LOWER SUSPENSION ARM CYLINDER PIN**

INITIAL SETUP:**Tools and Special Tools**

Kit, Lower Suspension Arm Cylinder Pin Removal
(WP 0168, Item 21)
Ram, Hydraulic, 50 Ton Portable (WP 0168, Item 24)
Standard Army Tool Set (SATS) (WP 0168, Item 28)

Equipment Conditions

Platform adjusted to 50 in. (127 cm) height (WP 0008)
All suspension isolation valves closed (WP 0004)
All four wheels removed from affected bogie (WP 0081,
WP 0080, WP 0079, and WP 0078)

Personnel Required

2

GENERAL INFORMATION

This work package contains instructions for the removal of the lower suspension cylinder pin.

REMOVAL**NOTE**

The following procedure is to be performed by depot support maintenance if the lower suspension arm cylinder pin cannot be removed by unit maintenance.

At this point, the affected bogie should be turned outboard, a hydraulic jack should be supporting the bogie, and 2 in. to 3 in. (50.8 mm to 76.2 mm) of suspension cylinder shaft should be exposed.

1. Install two nuts (Figure 1, Item 1) on spreader (Figure 1, Item 2) and install spreader in lower suspension arm (Figure 1, Item 16). Tighten two nuts fingertight.
2. Install ram (Figure 1, Item 9) on plate (Figure 1, Item 18) and secure with two lockwashers (Figure 1, Item 8) and screws (Figure 1, Item 7).
3. Install spacer (Figure 1, Item 17) on plate (Figure 1, Item 18) and secure with two screws (Figure 1, Item 19).
4. Install two nuts (Figure 1, Item 3) just inside of holes on each of two upper rods (Figure 1, Item 20), and then slide both rods through plate (Figure 1, Item 18).
5. Place plate (Figure 1, Item 18) and two upper rods (Figure 1, Item 20) over lower suspension arm (Figure 1, Item 16).

WARNING

The cylinder pin removal kit, when assembled, weighs in excess of 80 lb (36.3kg). Use two persons to lift the assembled kit or injury to personnel may result.

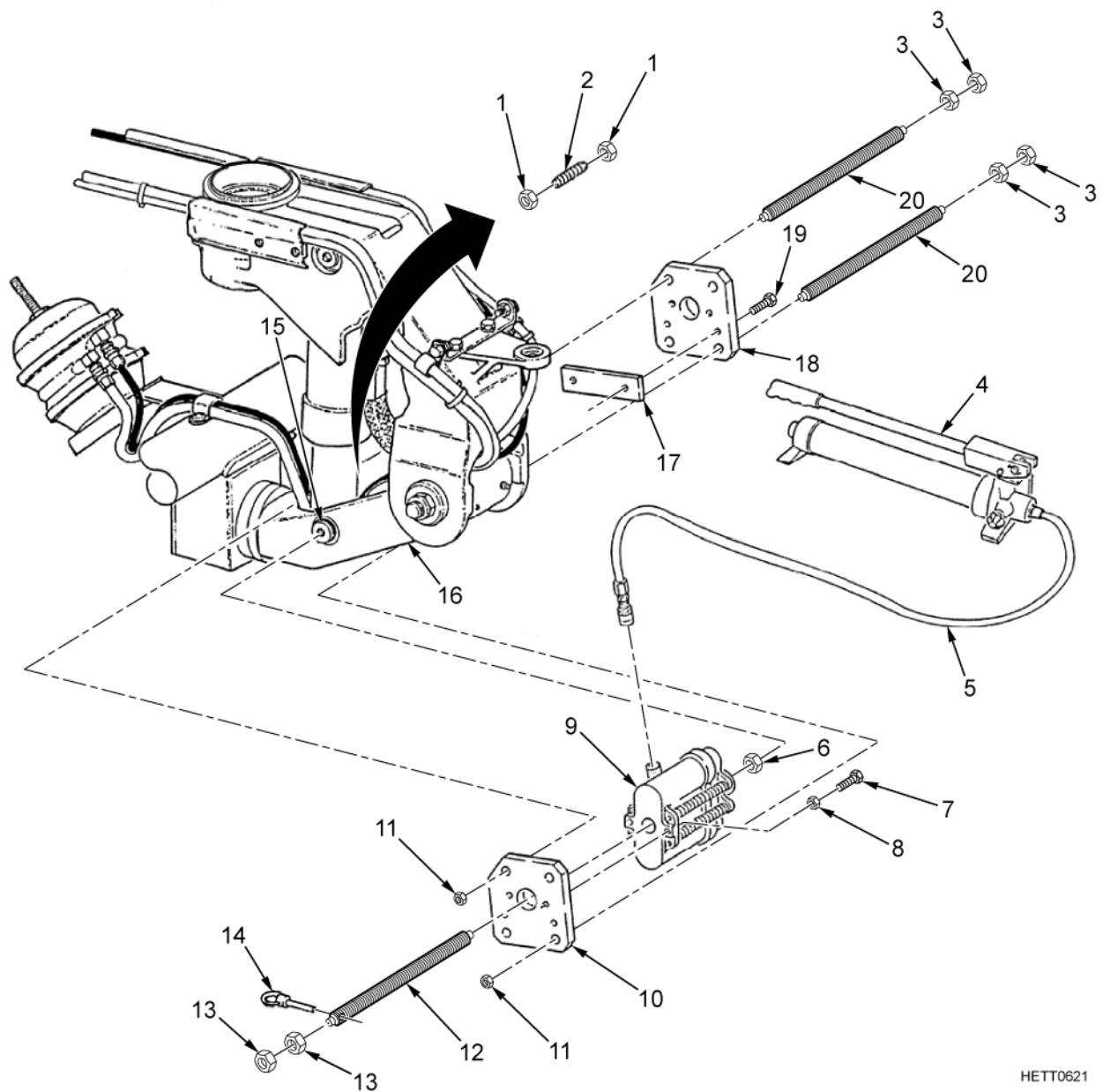
6. Use two persons to raise ram (Figure 1, Item 9) into position with moving part of ram toward grease fitting hole in lower suspension arm cylinder pin (Figure 1, Item 15). Slide upper holes in plate (Figure 1, Item 10) over two upper rods (Figure 1, Item 20) and secure with nut (Figure 1, Item 11) on each rod.
7. Install two nuts (Figure 1, Item 3) just inside of holes on each of two lower rods (Figure 1, Item 20), and then slide both rods through plate (Figure 1, Item 18) and plate (Figure 1, Item 10). Install two nuts (Figure 1, Item 11).

8. Position adjustment rod (Figure 1, Item 12) so that extended tip will seat into grease fitting cavity in lower suspension arm cylinder pin (Figure 1, Item 15) and slide adjustment rod through ram (Figure 1, Item 9). Install two nuts (Figure 1, Item 13) and push adjustment rod into grease fitting cavity. Install nut (Figure 1, Item 6) and tighten against ram (Figure 1, Item 9).
9. Tighten four nuts (Figure 1, Item 11) evenly.
10. Using a 15/16 in. wrench, tighten nuts (Figure 1, Item 13) against each other just inside pin hole in adjustment rod (Figure 1, Item 12).
11. Connect hose (Figure 1, Item 5) and hand pump (Figure 1, Item 4) to ram (Figure 1, Item 9). Operate hand pump and apply slight pressure to adjustment rod (Figure 1, Item 12). Check alignment of all parts to ensure lower suspension arm cylinder pin (Figure 1, Item 15) is in center of hole in plate (Figure 1, Item 18).

WARNING

When the ram is under pressure, keep personnel away from hole in plate. Cylinder pin could come out suddenly and injury to personnel may result.

12. Operate hand pump (Figure 1, Item 4). When ram (Figure 1, Item 9) extends full length, release pressure. As operator bleeds off hydraulic pressure on hand pump, hand-tighten nut (Figure 1, Item 6) against ram and use pin (Figure 1, Item 14) to turn adjustment rod (Figure 1, Item 12), keeping rod snug in grease fitting cavity. Tighten nut against ram.
13. If ram is unable to start cylinder pin (Figure 1, Item 15) moving, remove pin (Figure 1, Item 14) and position two nuts (Figure 1, Item 13) flush with end of adjustment rod (Figure 1, Item 12) and lock (jam) together. Strike end of adjustment rod with a 10-lb sledge hammer until pin begins moving.
14. Operate hand pump (Figure 1, Item 4) through two full extensions of ram (Figure 1, Item 9) until cylinder pin (Figure 1, Item 15) is removed.
15. Disconnect hand pump (Figure 1, Item 4) and hose (Figure 1, Item 5).
16. Remove nut (Figure 1, Item 6) from adjustment rod (Figure 1, Item 12), remove pin (Figure 1, Item 14), and then remove two nuts (Figure 1, Item 13).
17. Remove nut (Figure 1, Item 11) from each lower rod (Figure 1, Item 20) and remove both lower rods. Remove two nuts (Figure 1, Item 3) from each lower rod.
18. Remove nut (Figure 1, Item 11) from each upper rod (Figure 1, Item 20). Use two persons to hold ram (Figure 1, Item 9), and slide ram off of two upper rods. Remove two nuts (Figure 1, Item 3) from each upper rod.
19. Remove two screws (Figure 1, Item 7), lockwashers (Figure 1, Item 8), and ram (Figure 1, Item 9) from plate (Figure 1, Item 10).
20. Remove two screws (Figure 1, Item 19) and spacer (Figure 1, Item 17) from plate (Figure 1, Item 18).
21. Remove spreader (Figure 1, Item 2) and two nuts (Figure 1, Item 1) from lower suspension arm (Figure 1, Item 16).



HETT0621

Figure 1. Suspension Arm and 50 Ton Press.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
LOWER SUSPENSION ARM

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (WP 0168, Item 28)
Chain or Strap

Wood Block (TM 9-2330-381-24P)

Personnel Required

2

Materials/Parts

Crocus Cloth, Abrasive (WP 0170, Item 6)
Grease (WP 0170, Item 16)
Pipe Sealant (WP 0170, Item 22)
Solvent, Dry Cleaning (WP 0170, Item 32)
Locknut (TM 9-2330-381-24P)
Plain Seal (2) (TM 9-2330-381-24P)

References

WP 0066

Equipment Conditions

Axle removed (WP 0150)
If axle remains installed, wheels removed (WP 0081,
WP 0080, WP 0079, and WP 0078)

GENERAL INFORMATION

This work package contains instructions for the removal, disassembly, inspection, assembly, and installation of the lower suspension arm.

REMOVAL**WARNING**

Ensure hydraulic floor jack is properly supporting lower suspension arm during removal or injury to personnel may result. Failure to follow this warning may result in injury or death to personnel.

1. Place wood block under lower suspension arm (Figure 1, Item 3) and secure wood block and lower suspension arm to hydraulic floor jack with chain or strap.
2. Check position of hydraulic floor jack and make adjustments as necessary.
3. Remove suspension cylinder lower cylinder mounting pin from lower suspension arm (WP 0066).
4. Remove locknut (Figure 1, Item 4), hex head screw (Figure 1, Item 7), and two access covers (Figure 1, Item 5) from upper and lower suspension arms (Figure 1, Item 1 and Item 3). Discard locknut.
5. Use tape measure to measure from ground to top of spindle (Figure 1, Item 2). Record measurement.

NOTE

With suspension in its normally installed position, the smaller end of the shouldered shaft points toward curbside. Thus, on curbside suspensions, the smaller end will be outboard, and on streetside suspensions, the smaller end will be inboard.

6. Use hammer and drift to drive shouldered shaft (Figure 1, Item 6) from lower suspension arm (Figure 1, Item 3).
7. Use two people to separate lower suspension arm (Figure 1, Item 3) from upper suspension arm (Figure 1, Item 1) by pulling hydraulic floor jack, with lower suspension arm attached, away from upper suspension arm.

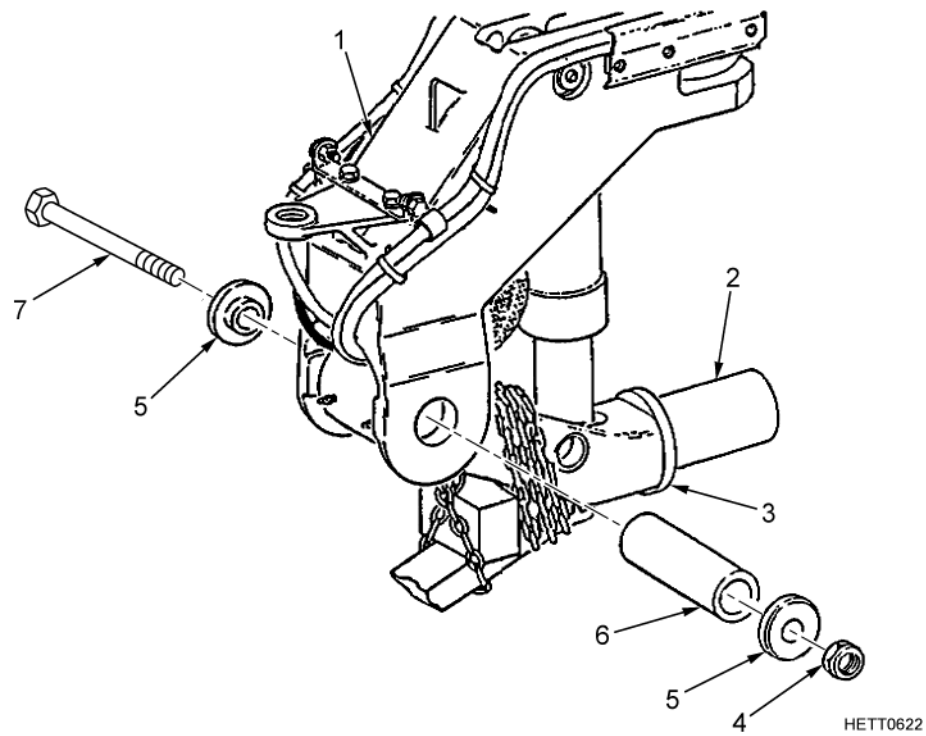


Figure 1. Lower Suspension Arm Bushing.

END OF TASK

DISASSEMBLY

1. Remove two plain seals (Figure 2, Item 3) from lower suspension arm (Figure 2, Item 1). Discard plain seals.
2. Use hammer and brass drift to drive two sleeve bearings (Figure 2, Item 2) from lower suspension arm (Figure 2, Item 1).
3. Remove two grease fittings (Figure 2, Item 4) from lower suspension arm (Figure 2, Item 1).

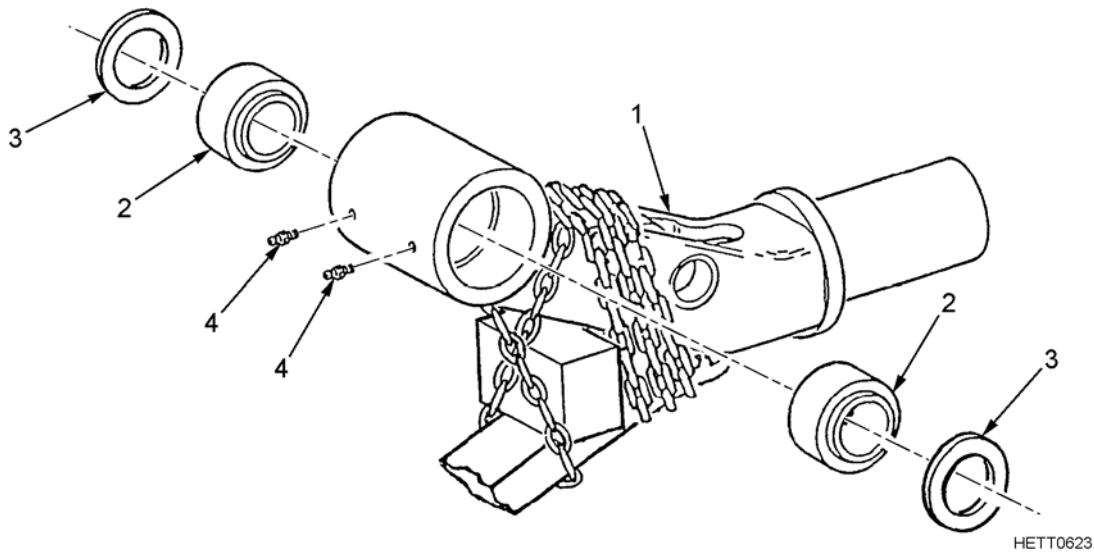


Figure 2. Sleeve and Bearings.

END OF TASK

INSPECTION**WARNING****SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
- The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound.
- Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.

Failure to follow these warnings may result in injury or death to personnel.

1. Inspect lower suspension arm casting and attaching hardware for cracks, gouges, bends, and corrosion. Clean with dry cleaning solvent. Replace any parts found defective.
2. Remove nicks and polish scored spindle surface with crocus cloth. If casting has defects, replace casting.

END OF TASK

ASSEMBLY

1. Apply pipe sealant to threads of two grease fittings (Figure 3, Item 4) and then install fittings in lower suspension arm (Figure 3, Item 1). When fittings are tight, nipples must point upward.
2. Apply grease to two sleeve bearings (Figure 3, Item 2) and bore of lower suspension arm (Figure 3, Item 1).
3. Use soft-faced hammer to install two sleeve bearings (Figure 3, Item 2) into lower suspension arm (Figure 3, Item 1).
4. Install two plain seals (Figure 3, Item 3) to lower suspension arm (Figure 3, Item 1).

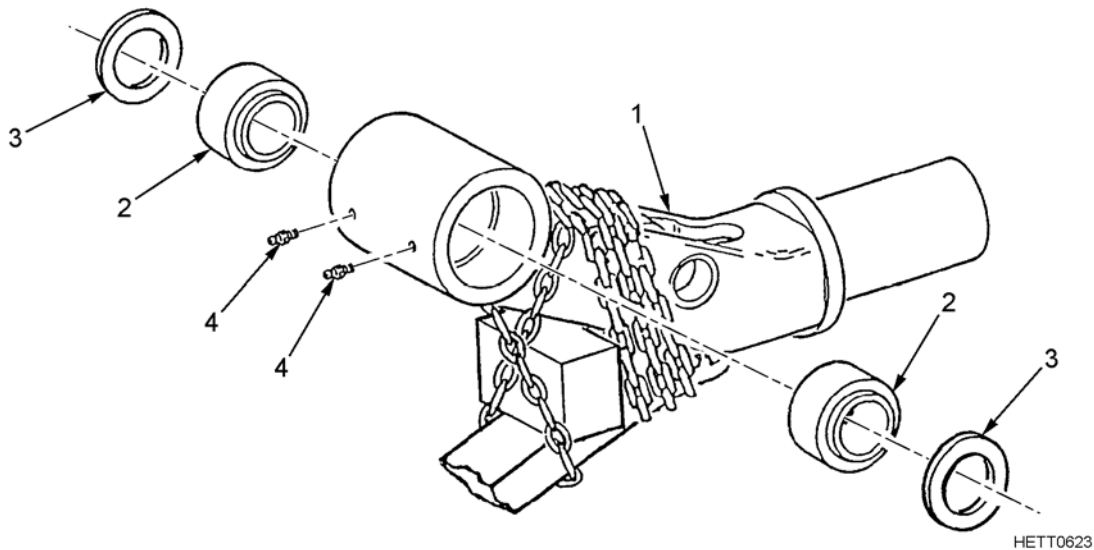


Figure 3. Sleeve and Bearings.

END OF TASK

INSTALLATION

1. Use two people to maneuver hydraulic floor jack supporting lower suspension arm (Figure 4, Item 3) and align lower suspension arm with upper suspension arm (Figure 4, Item 1).
2. Apply grease to inside bore of assembly joint for both upper and lower suspension arms (Figure 4, Item 1 and Item 3) and to exterior of shouldered shaft (Figure 4, Item 6).
3. Insert smaller end of shouldered shaft (Figure 4, Item 6), through larger bore in upper suspension arm (Figure 4, Item 1) and into bore in lower suspension arm (Figure 4, Item 3) until shaft movement is stopped by lip at bearing oil seal.
4. Use a 0.015-in. blade, on 20-blade feeler gauge set, inserted in smaller bore of upper suspension arm (Figure 4, Item 1) to carefully adjust position of lip of bearing oil seal up onto small end of shouldered shaft (Figure 4, Item 6).
5. Use soft-faced hammer to drive shouldered shaft (Figure 4, Item 6) into upper and lower suspension arms (Figure 4, Item 1 and Item 3).
6. Install two access covers (Figure 4, Item 5), hex head screw (Figure 4, Item 7), and locknut (Figure 4, Item 4) to upper and lower suspension arms (Figure 4, Item 1 and Item 3).

NOTE

Cylinder may have to be compressed using hydraulic floor jack to allow pin installation.

7. Align and install suspension cylinder lower cylinder mounting pin to lower suspension arm (Figure 4, Item 3) (WP 0066).
8. Remove chain or strap and wood block. Leave hydraulic floor jack in place.
9. Use hydraulic floor jack to adjust height of spindle (Figure 4, Item 2) to measurement previously recorded.

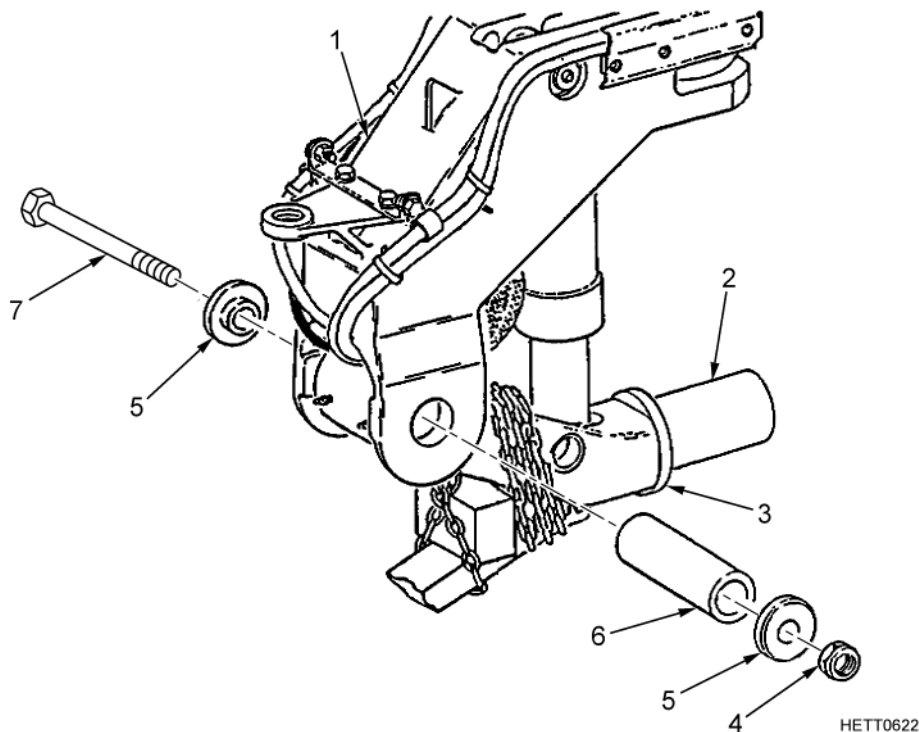


Figure 4. Sleeve and Bearings.

END OF TASK

FOLLOW-ON MAINTENANCE

Install axle (WP 0150).

Perform required lubrication to suspension assembly (WP 0163).

END OF WORK PACKAGE

FIELD MAINTENANCE

CONNECTING LINK SLEEVE BEARINGS

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (SATS) (WP 0168, Item 28)

Personnel Required

1

Materials/Parts

Grease (WP 0170, Item 16)
Sealing Compound, Thread Locking (WP 0170, Item 25)

Equipment Conditions

Connecting link removed (WP 0082)

GENERAL INFORMATION

This work package contains instructions for disassembly and assembly of the connecting sleeve bearings.

DISASSEMBLY

1. On steering connecting link, use an arbor press to press two sleeve bearings (Figure 1, Item 4) from connecting link rod ends (Figure 1, Item 5).
2. On non-steering connecting link, remove two setscrews (Figure 1, Item 3) and use an arbor press to press two plain bearings (Figure 1, Item 1) from connecting rod ends (Figure 1, Item 2).

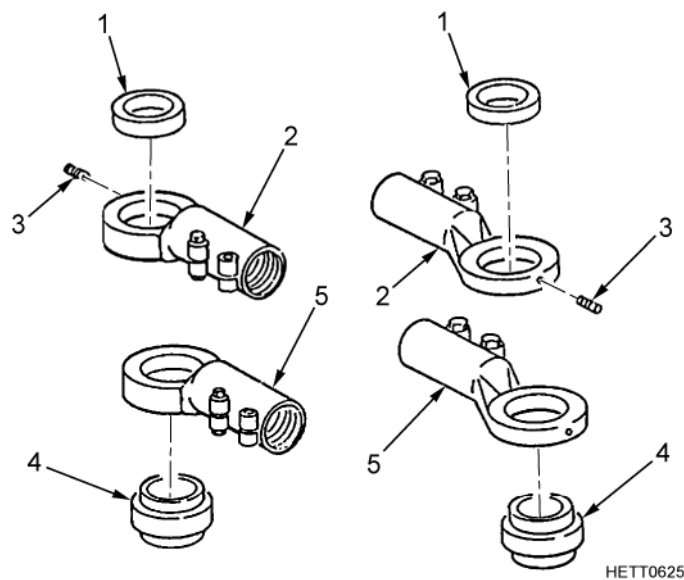


Figure 1. Connecting Link Sleeve Bearings Disassembly.

END OF TASK

ASSEMBLY

1. On non-steering connecting rods, apply grease to two plain bearings (Figure 2, Item 1) and use an arbor press to install bearings in connecting link rod ends (Figure 2, Item 2).
2. Apply thread locking compound to two setscrews (Figure 2, Item 3) and install setscrews into connecting link rod ends.

NOTE

The sleeve bearings are not symmetrical. One side has more urethane material protruding from the steel sleeve. Ensure that the side with more material is pointed down when installed.

3. On steering connecting rods, use an arbor press to install two sleeve bearings (Figure 2, Item 4) into connection link rod ends (Figure 2, Item 5).

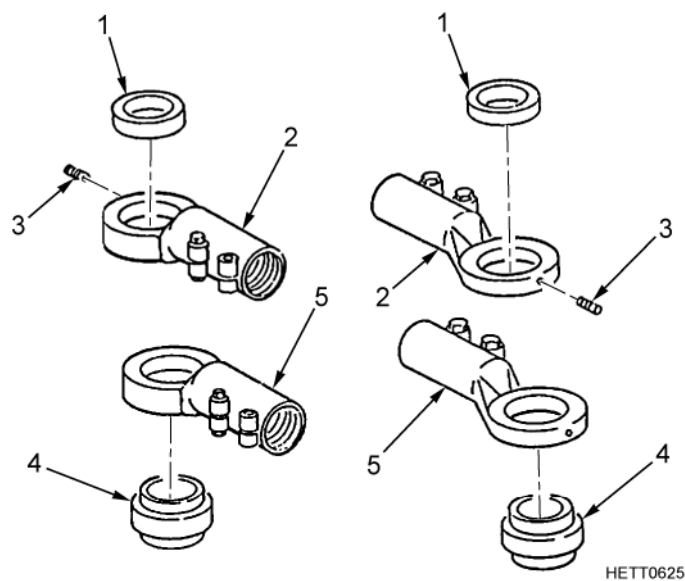


Figure 2. Connecting Link Sleeve Bearings Assembly.

END OF TASK

Install axle (WP 0150).

END OF WORK PACKAGE

FIELD MAINTENANCE**STEERING CONSOLE AND SLIDE SHAFT ASSEMBLY**

INITIAL SETUP:**Tools and Special Tools**

Mandrel, Suspension (WP 0168, Item 5)
General Mechanic's Tool Kit (WP 0168, Item 11)
Lifting Strap (WP 0168, Item 25)
Standard Army Tool Set (SATS) (WP 0168, Item 28)

Ring Spacer (2)
Recessed Spacer (1)
Lockwasher (8)
Lockwasher (8)

Personnel Required

2

Materials/Parts

Crocus Cloth (WP 0170, Item 6)
Grease (WP 0170, Item 16)
Sealing Compound Thread Locking (WP 0170, Item 25)
Solvent, Dry Cleaning (WP 0170, Item 32)
Strap, Tiedown (as required) (WP 0170, Item 33)
Lockwasher (1)

Equipment Conditions

Both gooseneck steering cylinders removed (WP 0086)
Solar battery charger removed (some semitrailers)
(WP 0054)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the steering console and slide shaft assembly.

REMOVAL**WARNING**

The steering column housing is heavy and must be supported the entire time work is performed. Failure to follow this warning may result in injury or death to personnel.

1. Use davit (Figure 1, Item 4) and two lifting straps (Figure 1, Item 5) to wrap two lifting straps through inside eyes of steering column housing (Figure 1, Item 7). Attach one end of each lifting strap to hook on davit and take up slack in straps.
2. Remove eight capscrews (Figure 1, Item 1) and lockwashers (Figure 1, Item 18) from gooseneck. Discard lockwashers.
3. Use crowbar and two people to pry up and remove mending plate (Figure 1, Item 17) from top of gooseneck and remove lubrication fitting (Figure 1, Item 3) from mending plate.

NOTE

If sleeve bearing is to be removed, the sleeve bushing must be replaced.

4. If necessary, use a hammer and brass drift to remove sleeve bushing (Figure 1, Item 16) from mending plate (Figure 1, Item 17). If removed, discard sleeve bearing.
5. If damaged, drive three spring pins (Figure 1, Item 2) from gooseneck.
6. Remove bolt (Figure 1, Item 15), lockwasher (Figure 1, Item 14), and rod end connector (Figure 1, Item 13) from straight shouldered pin (Figure 1, Item 19). Discard lockwasher.
7. Remove lubrication fitting (Figure 1, Item 20) from straight shouldered pin (Figure 1, Item 19).

NOTE

Pins must be pulled upward through steering gear arm opening.

8. Grip top of straight shouldered pin (Figure 1, Item 19) and, while twisting pin side to side, pull up and remove straight shouldered pin from steering gear arm (Figure 1, Item 12).

NOTE

The two ring spacers may fall to the ground while slide shaft assembly is being removed.

9. Rotate steering column housing (Figure 1, Item 7) so that slide shaft assembly (Figure 1, Item 6) clears steering gear arm (Figure 1, Item 12). Pick up or remove two ring spacers (Figure 1, Item 11) from slide shaft assembly. Discard two ring spacers.
10. Push steering gear arm (Figure 1, Item 12) as far as possible toward curbside of gooseneck.
11. Secure slide shaft assembly (Figure 1, Item 6) to steering column housing (Figure 1, Item 7) using electrical tiedown straps.
12. Rotate steering column housing (Figure 1, Item 7) toward streetside of gooseneck and, using two people, davit (Figure 1, Item 4), and crowbar, pry up and hoist steering column housing up and out of gooseneck.
13. Use two people and davit (Figure 1, Item 4), to maneuver and lower steering column housing (Figure 1, Item 7) to the ground. Remove two straps (Figure 1, Item 5) from hook on davit.
14. Remove recessed spacer (Figure 1, Item 8) and lubrication fitting (Figure 1, Item 10) from gooseneck. Discard recessed spacer.
15. Remove electrical tiedown straps from slide shaft assembly (Figure 1, Item 6) and steering column housing (Figure 1, Item 7). Use two people to pull slide shaft assembly completely out of steering column housing.

17. Remove eight capscrews (Figure 2, Item 12 and Item 6), lockwashers (Figure 2, Item 11 and Item 7), and two access covers (Figure 2, Item 10 and Item 5) from steering column housing (Figure 2, Item 3). Discard lockwashers.
18. Drive two sleeve bearings (Figure 2, Item 9 and Item 4) from steering column housing (Figure 2, Item 3). Remove two lubrication fittings (Figure 2, Item 8) from steering column housing.
19. Remove setscrew (Figure 2, Item 13) and, using an arbor press, press bearing (Figure 2, Item 1) from slide shaft assembly (Figure 2, Item 2).
20. Inspect steering column housing (Figure 2, Item 3) and related parts for corrosion, nicked surfaces, scored bearing surfaces, and any breaks in casting.

WARNING



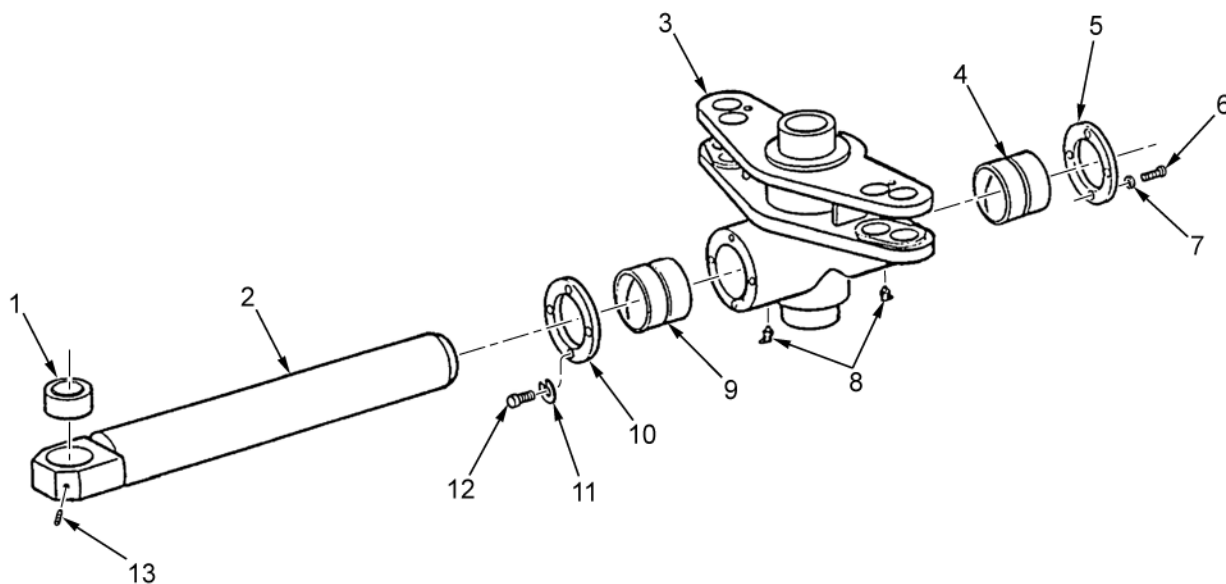
SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)

- **Sqnxgpv'engcplpi 'eqo r qwpf 'O KN/RTH/8: 2'V{ r g'hlt pf 'V{ r g'imlb c{ 'dg'lt tlc vpi 'vq'vj g'g[gu'cpf 'tinp0'Wig** protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
- The flashpoint for Type II solvent cleaning compound is 141° to 198°F (61° to 92°C) and for Type III it is 200° to 241°F (93° to 116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound.
- Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.

Failure to follow these warnings may result in injury or death to personnel.

21. Clean all components with dry cleaning solvent and rags.
22. Clean corrosion with crocus cloth.
23. Apply grease to exterior and interior of bearing (Figure 2, Item 1) and, using an arbor press, press bearing into slide shaft assembly (Figure 2, Item 2).
24. Apply thread locking compound to threads of setscrew (Figure 2, Item 13) and install setscrew into slide shaft assembly (Figure 2, Item 2) to secure bearing (Figure 2, Item 1).
25. Install two lubrication fittings (Figure 2, Item 8) onto steering column housing (Figure 2, Item 3).
26. Apply grease to inner bore of steering column housing (Figure 2, Item 3) and interior and exterior of two sleeve bushings (Figure 2, Item 9 and Item 4). Install two sleeve bushings into steering column housing.

27. Install two access covers (Figure 2, Item 10 and Item 5) onto steering column housing (Figure 2, Item 3) and secure with eight capscrews (Figure 2, Item 12 and Item 6) and lockwashers (Figure 2, Item 11 and Item 7).
28. Apply grease to slide shaft assembly (Figure 2, Item 2) and install slide shaft assembly into steering column housing (Figure 2, Item 3).



HETT0627

Figure 2. Steering Column Housing.

END OF TASK

INSTALLATION

1. Apply grease to exterior of sleeve bushing (Figure 3, Item 7) and, using a soft-faced hammer, drive sleeve bushing into gooseneck.

NOTE

A large amount of grease applied to recessed spacer helps to hold the spacer in place during installation of steering column housing.

2. Liberally apply grease to recessed spacer (Figure 3, Item 6) and place recessed spacer over sleeve bushing (Figure 3, Item 7).
3. Install lubrication fitting (Figure 3, Item 8) into gooseneck.
4. Align and install suspension mandrel (Figure 3, Item 2) into bearing of slide shaft assembly (Figure 3, Item 1).

CAUTION

Both ring spacers must be completely compressed and must uniformly cover/expand over bearing of slide shaft assembly prior to tightening suspension mandrel or not enough clearance will be available for installation and damage to equipment may result.

NOTE

Each ring spacer is actually made of two pieces that if not handled carefully can be separated.

5. Align two ring spacers (Figure 3, Item 9) over each end of suspension mandrel (Figure 3, Item 2). Compress each ring spacer flush onto bearing of slide shaft assembly (Figure 3, Item 1) and tighten adjusting bolt in suspension mandrel to secure both ring spacers in place.
6. Use two people, lifting straps (Figure 3, Item 4), and davit (Figure 3, Item 3) to raise steering column housing (Figure 3, Item 5) up above gooseneck. Then, rotate davit and lower steering column housing back down into place in gooseneck.
7. Position slide shaft assembly (Figure 3, Item 1) to a height even with slide shaft assembly mounting point on steering gear arm (Figure 3, Item 10).

CAUTION

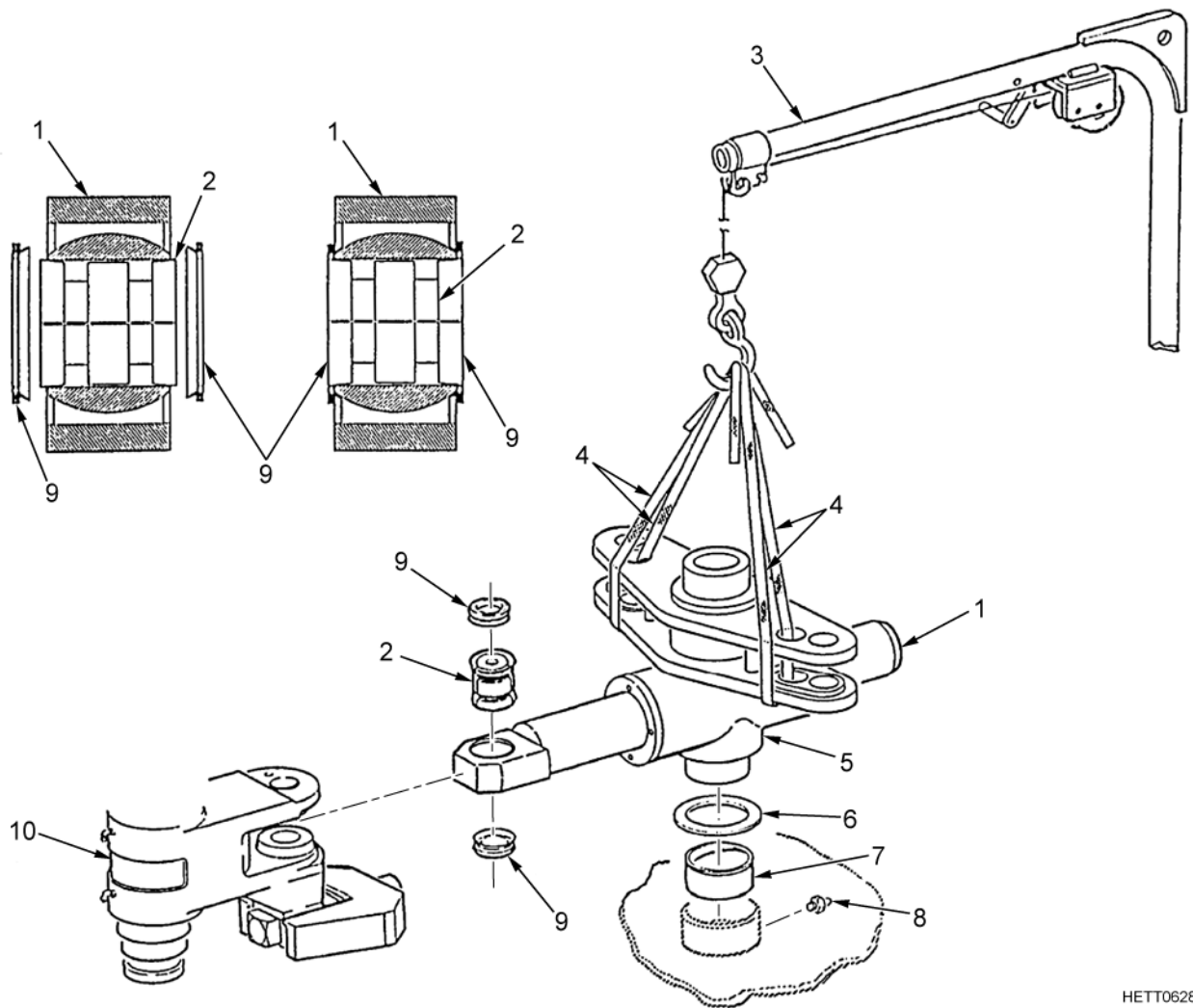
When installing slide shaft assembly to steering gear arm, ensure ring spacers do not work loose or become misaligned. If spacers are misaligned or work loose, stop the installation and remove slide shaft assembly or damage to the spacers may result. It may take a few attempts to accomplish proper spacer installation. Ensure head of the suspension mandrel adjusting bolt, in center of the mandrel, faces upward during installation or you will be unable to loosen the bolt and/or remove the mandrel once slide shaft assembly is in place.

8. Use two people to carefully maneuver bearing end of slide shaft assembly (Figure 3, Item 1) into steering arm gear (Figure 3, Item 10) ensuring head of adjusting bolt inside suspension mandrel (Figure 3, Item 2) is facing upward. Check condition of both ring spacers (Figure 3, Item 9) during entire installation.

NOTE

During installation of bearing end of slide shaft assembly, one person can observe the position of the cylinder by looking through the hole at the top of steering gear arm.

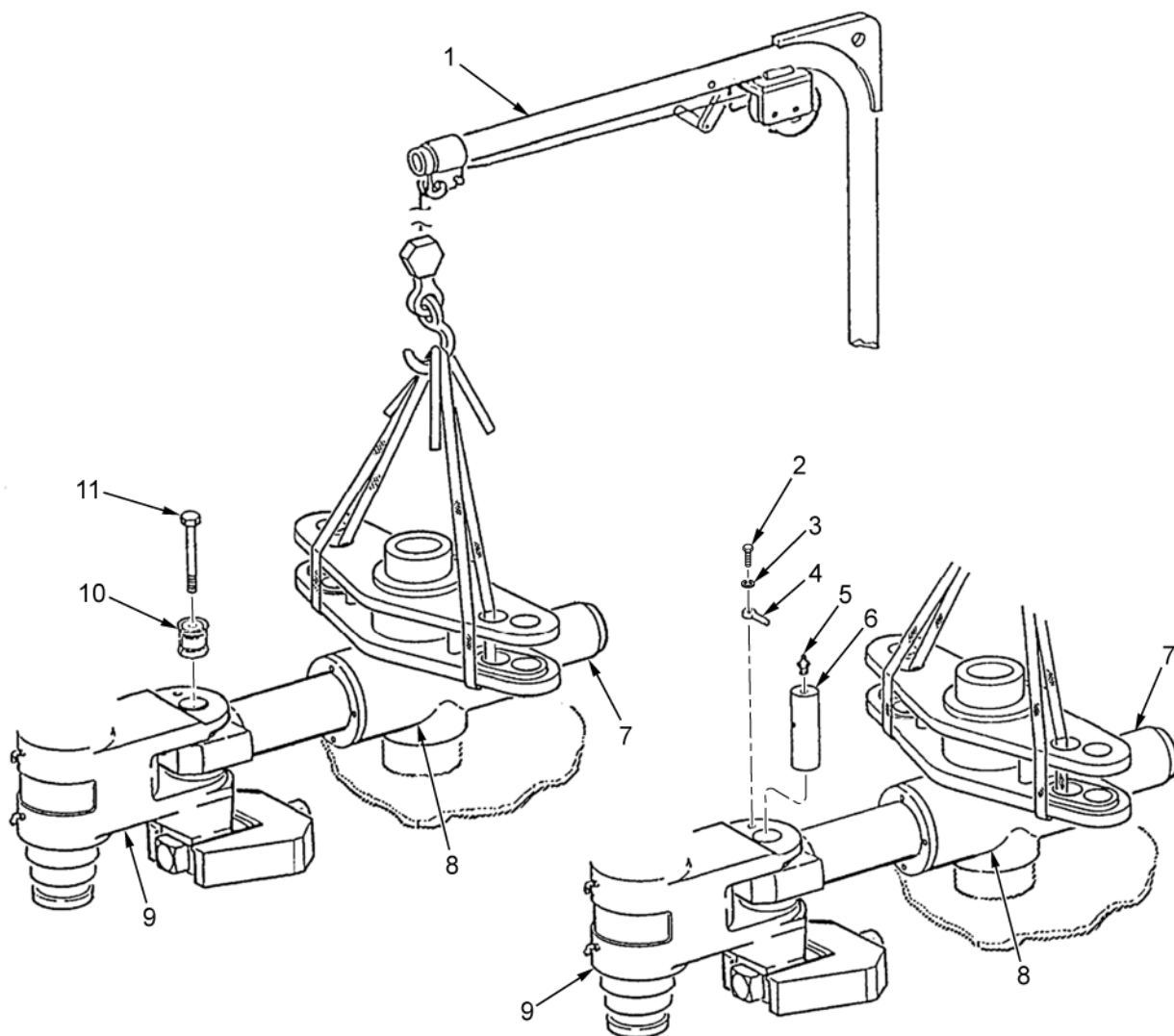
9. Once slide shaft assembly (Figure 3, Item 1) is in place, loosen and remove adjusting bolt from suspension mandrel (Figure 3, Item 2).



HETT0628

Figure 3. Suspension Mandrel.

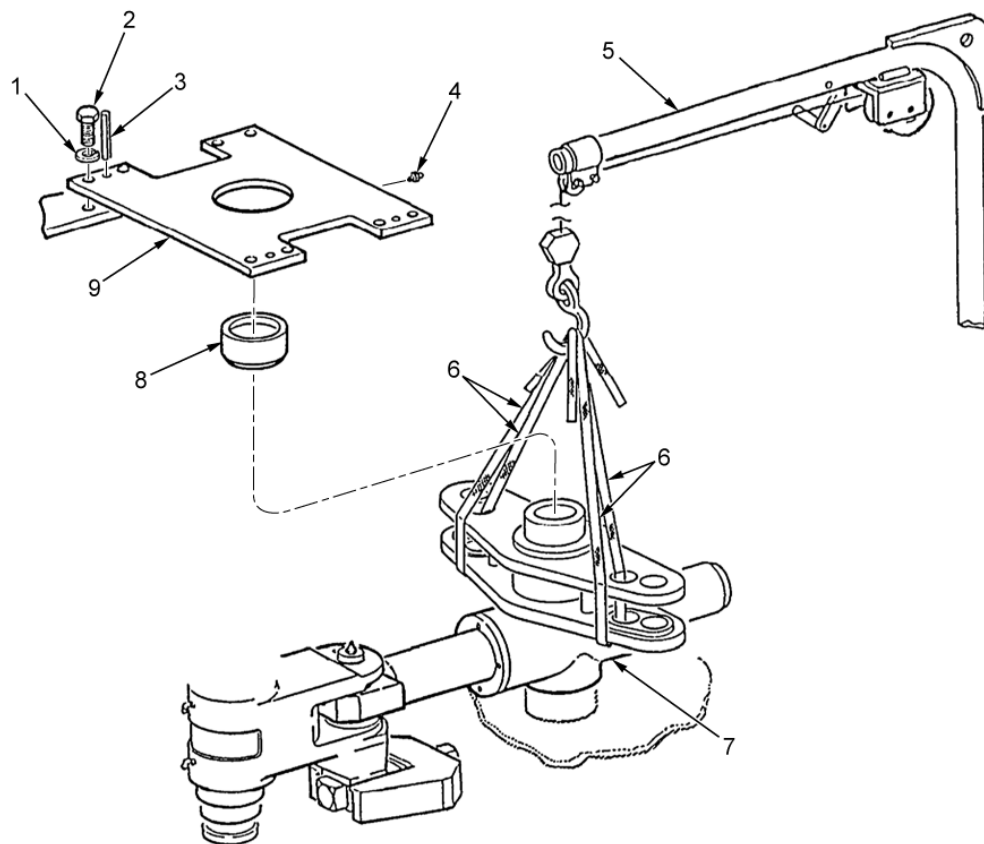
10. With davit (Figure 4, Item 1) supporting steering column housing (Figure 4, Item 8), align and install special bolt (Figure 4, Item 11) into suspension mandrel (Figure 4, Item 10). Start to tighten special bolt into mandrel.
11. Once threads of special bolt (Figure 4, Item 11) start to engage into suspension mandrel (Figure 4, Item 10), pull upon special bolt and remove both special bolt and suspension mandrel from steering gear arm (Figure 4, Item 9).
12. Remove special bolt (Figure 4, Item 11) from suspension mandrel (Figure 4, Item 10) and reinstall original bolt back into mandrel.
13. Apply grease to straight shouldered pin (Figure 4, Item 6), and position pin so that hole for rod end connector (Figure 4, Item 4) is in alignment.
14. Align and install rod end connector (Figure 4, Item 4) into straight shouldered pin (Figure 4, Item 6) and, using a soft-faced hammer, drive straight shouldered pin through top of steering gear arm (Figure 4, Item 9) and into slide shaft assembly (Figure 4, Item 7).
15. Secure rod end connector (Figure 4, Item 4) with screw (Figure 4, Item 2) and lockwasher (Figure 4, Item 3).
16. Install lubrication fitting (Figure 4, Item 5) into straight shouldered pin (Figure 4, Item 6).



HETT0629

Figure 4. Lifting Straps.

17. Remove two lifting straps (Figure 5, Item 6) and davit (Figure 5, Item 5) from steering column housing (Figure 5, Item 7). Restow davit.
18. Install three spring pins (Figure 5, Item 3) to gooseneck.
19. Apply grease to exterior of sleeve bushing (Figure 5, Item 8) and, using a soft-faced hammer, drive sleeve bushing into mending plate.
20. Install lubrication fitting (Figure 5, Item 4) into mending plate.
21. Align mending plate (Figure 5, Item 9) over steering column housing (Figure 5, Item 7) and three spring pins (Figure 5, Item 3). Use two people to lower mending plate onto three spring pins and steering column housing.
22. Secure mending plate (Figure 5, Item 9) to gooseneck by installing eight lockwashers (Figure 5, Item 1) and capscrews (Figure 5, Item 2).



HETT0630

Figure 5. Lifting Straps and Davit.

END OF TASK**FOLLOW-ON MAINTENANCE**

Install steering (master) cylinders (WP 0086).

Install solar panel (some semitrailers) (WP 0054).

Perform required lubrication (WP 0163).

Couple tractor/semitrailer (WP 0013).

Manually steer semitrailer and check for proper operation (WP 0010).

END OF WORK PACKAGE

FIELD MAINTENANCE
KINGPIN AND STEERING ARM

INITIAL SETUP:

Tools and Special Tools

Wrench, Spanner (WP 0168, Item 4)
General Mechanic's Tool Kit (WP 0168, Item 11)
Lifting Strap (4) (WP 0168, Item 25)
Standard Army Tool Set (SATS) (WP 0168, Item 28)
Davit (WP 0168, Item 29)

Lockwasher (1)
Lockwasher (2)
Lockwasher (1)
Suspension Spacer

Personnel Required
2

Materials/Parts

Crocus Cloth (WP 0170, Item 6)
Grease (WP 0170, Item 16)

Equipment Conditions

Steering console and slide shaft assembly removed

GENERAL INFORMATION

This work package contains instructions for removal, repair or replacement, and installation of the king pin and steering arm.

REMOVAL**WARNING**

The kingpin and steering arm are heavy and must be supported the entire time work is performed or injury to personnel may result.

WARNING

- On some semitrailers, a solar battery charger is mounted on the top of the gooseneck directly in front of the spare tires. Persons working on top of the gooseneck must take **EXTREME** care not to step on it or trip over it.
- When on top of the gooseneck, always hold the handrail with one hand to avoid falling or injury to personnel may result.

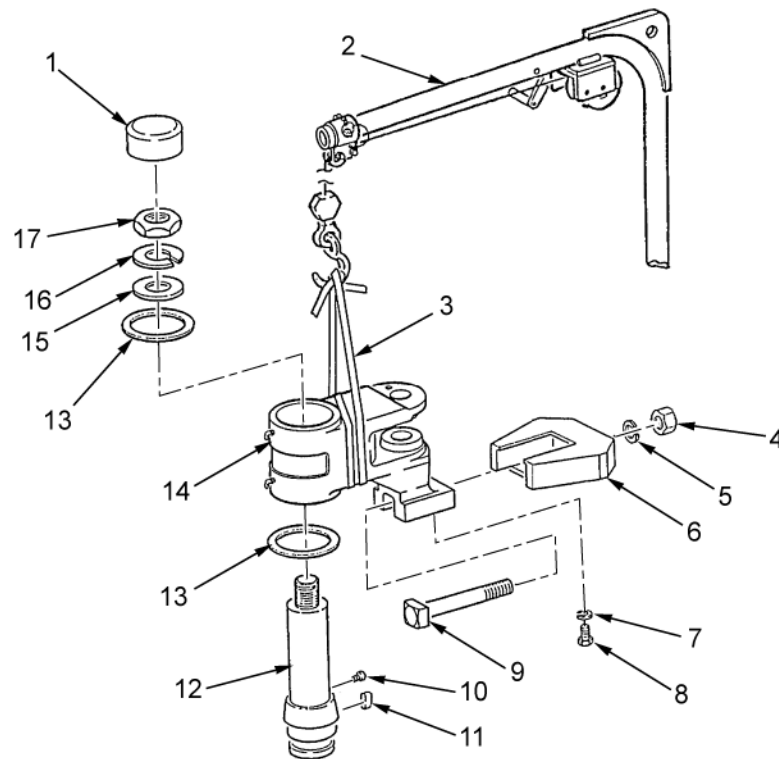
Failure to follow these warnings may result in injury to personnel or damage to equipment.

1. Using davit (Figure 1, Item 2) and lifting strap (Figure 1, Item 3), wrap lifting strap around steering gear arm (Figure 1, Item 14). Attach lifting strap to hook from davit.

WARNING

Exercise caution during removal of the kingpin. Support the kingpin from the bottom side of the gooseneck during removal or the kingpin may fall and injure personnel. Failure to follow this warning may result in injury or death to personel.

2. Remove protective cap (Figure 1, Item 1) from kingpin nut (Figure 1, Item 17).
3. Use a 1-in. drive ratchet, extension, and 3-in. socket to remove kingpin nut (Figure 1, Item 17), lockwasher (Figure 1, Item 16), and flat washer (Figure 1, Item 15) from gooseneck. Drive kingpin (Figure 1, Item 12) from gooseneck. Discard lockwasher.
4. Remove capscrew (Figure 1, Item 10) and machine key (Figure 1, Item 11) from kingpin (Figure 1, Item 12).
5. If installed, remove two capscrews (Figure 1, Item 8) and lockwashers (Figure 1, Item 7) from steering gear arm (Figure 1, Item 14). Discard lockwashers.
6. Remove nut (Figure 1, Item 4), lockwasher (Figure 1, Item 5), and capscrew (Figure 1, Item 9) from steering gear arm (Figure 1, Item 14). Discard lockwasher.
7. Slide steering wedge (Figure 1, Item 6) off of steering gear arm (Figure 1, Item 14).
8. Use two people and davit (Figure 1, Item 2) to remove steering gear arm (Figure 1, Item 14) from gooseneck. Raise steering gear arm up and out of gooseneck. Lower steering gear arm to the ground for further disassembly.
9. Remove two suspension spacers (Figure 1, Item 13) from gooseneck after steering gear arm (Figure 1, Item 14) is out and away from gooseneck. Discard two suspension spacers.



HETT0631

Figure 1. Kingpin and Steering Arm Removal.

END OF TASK

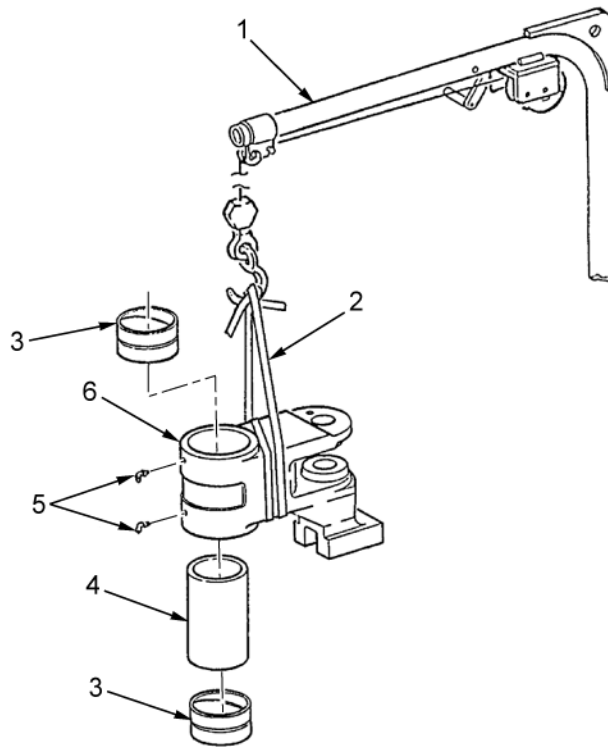
REPAIR OR REPLACEMENT

1. Remove lifting strap (Figure 2, Item 2) from hook on davit (Figure 2, Item 1).
2. Use hammer and brass drift to drive sleeve bushing (Figure 2, Item 4) out of steering gear arm (Figure 2, Item 6).
3. Drive two sleeve bearings (Figure 2, Item 3) out of steering gear arm (Figure 2, Item 6).
4. Inspect steering gear arm (Figure 2, Item 6), kingpin, and related parts for corrosion, nicked surfaces, scored bearing surfaces, and any breaks in casting. If corroded, clean with crocus cloth (WP 0170, Item 6). If parts are found defective, replace as necessary.
5. Install two lubrication fittings (Figure 2, Item 5) into steering gear arm (Figure 2, Item 6).
6. Apply grease to both interior and exterior of two sleeve bearings (Figure 2, Item 3) and sleeve bushing (Figure 2, Item 4).
7. Drive two sleeve bearings (Figure 2, Item 3) into steering gear arm (Figure 2, Item 6).

NOTE

The slot cut out in the sleeve bushing must be placed so that it faces aft when installed into the steering gear arm. The position of the sleeve bushing slot provides alignment for the kingpin.

8. Align slot in sleeve bushing (Figure 2, Item 4) so that it is positioned aft in steering gear arm (Figure 2, Item 6). Drive sleeve bushing, slot end first with slot facing aft, into steering arm gear.
9. Wrap lifting strap (Figure 2, Item 2) around steering gear arm (Figure 2, Item 6) and attach each end of lifting strap to hook on davit (Figure 2, Item 1).



HETT0632

Figure 2. Kingpin and Steering Arm Repair.

END OF TASK

INSTALLATION**NOTE**

Applying a large amount of grease to suspension spacer holds the spacer in place during installation of steering gear arm.

1. Liberally apply grease onto two suspension spacers (Figure 3, Item 13 and Item 15). Install suspension spacer (Figure 3, Item 13) onto bottom of steering gear arm (Figure 3, Item 14).

NOTE

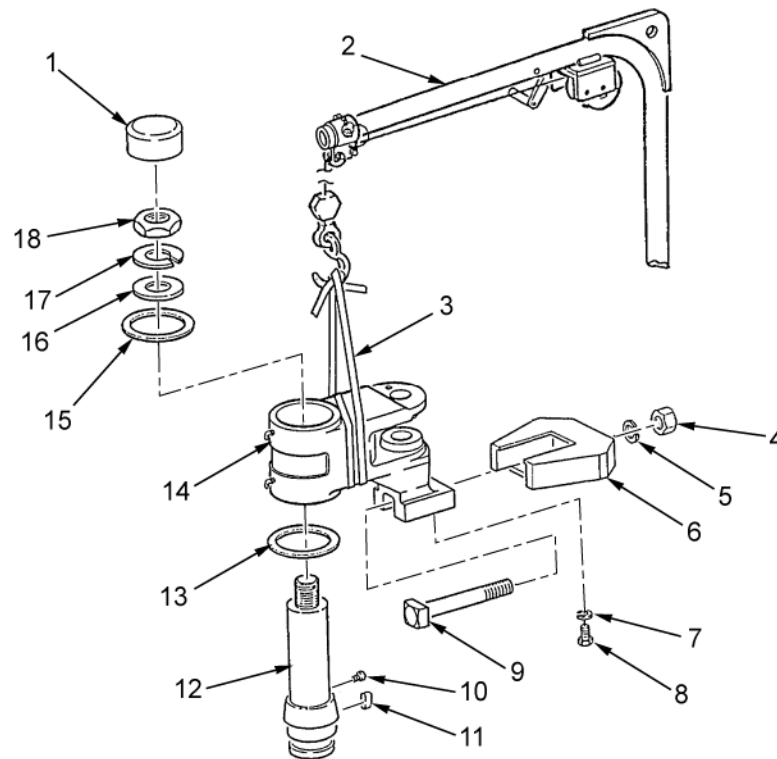
When installing steering gear arm into gooseneck, ensure the bottom suspension spacer stays in place on steering gear arm.

2. Use two people and davit (Figure 3, Item 2) to align and install steering gear arm (Figure 3, Item 14) into gooseneck. Check that first suspension spacer (Figure 3, Item 13) on bottom of steering gear arm is properly positioned on arm and aligned with hole in bottom of gooseneck for kingpin (Figure 3, Item 12).
3. Align and tap second suspension spacer (Figure 3, Item 15) into place on top of steering gear arm (Figure 3, Item 14). Continue to tap suspension spacer (Figure 3, Item 15) until spacer is aligned with hole in top of gooseneck for kingpin (Figure 3, Item 12).
4. Align and install steering wedge (Figure 3, Item 6) on steering gear arm (Figure 3, Item 14). Push steering wedge forward against steering gear arm.
5. Install capscrew (Figure 3, Item 9), nut (Figure 3, Item 4), and lockwasher (Figure 3, Item 5) into steering gear arm (Figure 3, Item 14). Push steering wedge (Figure 3, Item 6) forward against steering gear arm. Tighten nut.
6. Install two lockwashers (Figure 3, Item 7) and capscrews (Figure 3, Item 8).
7. Install capscrew (Figure 3, Item 10) and machine key (Figure 3, Item 11) into kingpin (Figure 3, Item 12).
8. Apply grease to bearing surface of kingpin (Figure 3, Item 12).
9. Use two people to align capscrew (Figure 3, Item 10) with slot of sleeve bushing inside steering gear arm (Figure 3, Item 14). Install kingpin (Figure 3, Item 12) into gooseneck through steering gear arm (Figure 3, Item 14).

NOTE

The top of the kingpin threaded portion will be below the top of the nut when tightened. Distance from the top of the nut to the top of the kingpin must not exceed 0.200 in. (0.50.8 mm) (approximately 2-1/3 threads) when properly installed and torqued.

10. While one person holds kingpin (Figure 3, Item 12) from bottom and second person is positioned on top of gooseneck, install flat washer (Figure 3, Item 16), lockwasher (Figure 3, Item 17), and kingpin nut (Figure 3, Item 18). Use a torque wrench, extension, adapter, and 3-in socket to torque kingpin nut to 420 to 460 lb-ft (520 to 624 Nm).
11. Install protective cap (Figure 3, Item 1) on kingpin nut (Figure 3, Item 18).
12. Remove lifting strap (Figure 3, Item 3) from steering gear arm (Figure 3, Item 14) and hook on davit (Figure 3, Item 2).



HETT0926

Figure 3. Kingpin and Steering Arm Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Install steering console and slide shaft assembly (WP 0155).

Perform required lubrication (WP 0034).

Couple tractor/semitrailer (WP 0013).

Manually steer semitrailer and check for proper operation (WP 0010).

END OF WORK PACKAGE

FIELD MAINTENANCE
HYDRAULIC CONTROL MODULE FRAME

INITIAL SETUP:**Tools and Special Tools**

Chain Assembly (WP 0168, Item 8)
General Mechanic's Tool Kit (WP 0168, Item 11)
Truck, Wrecker M984 (WP 0168, Item 26)
Standard Army Tool Set (WP 0168, Item 28)

Lockwasher (3)
Cotter Pin (1)

Personnel Required

2

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
Solvent, Dry Cleaning (WP 0170, Item 32)
Lockwasher (6)
Lockwasher (3)

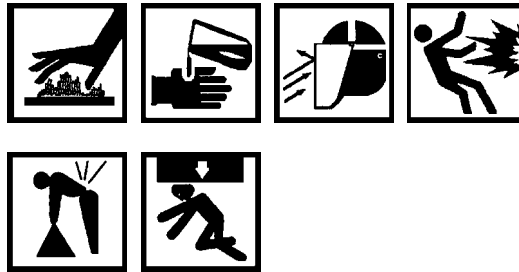
Equipment Conditions

Front and rear support legs lowered supporting platform
(WP 0011 and WP 0012)
Gooseneck supported (WP 0007)
Hydraulic tank drained (WP 0040)

GENERAL INFORMATION

This work package contains instructions for removal and installation of the hydraulic control module frame.

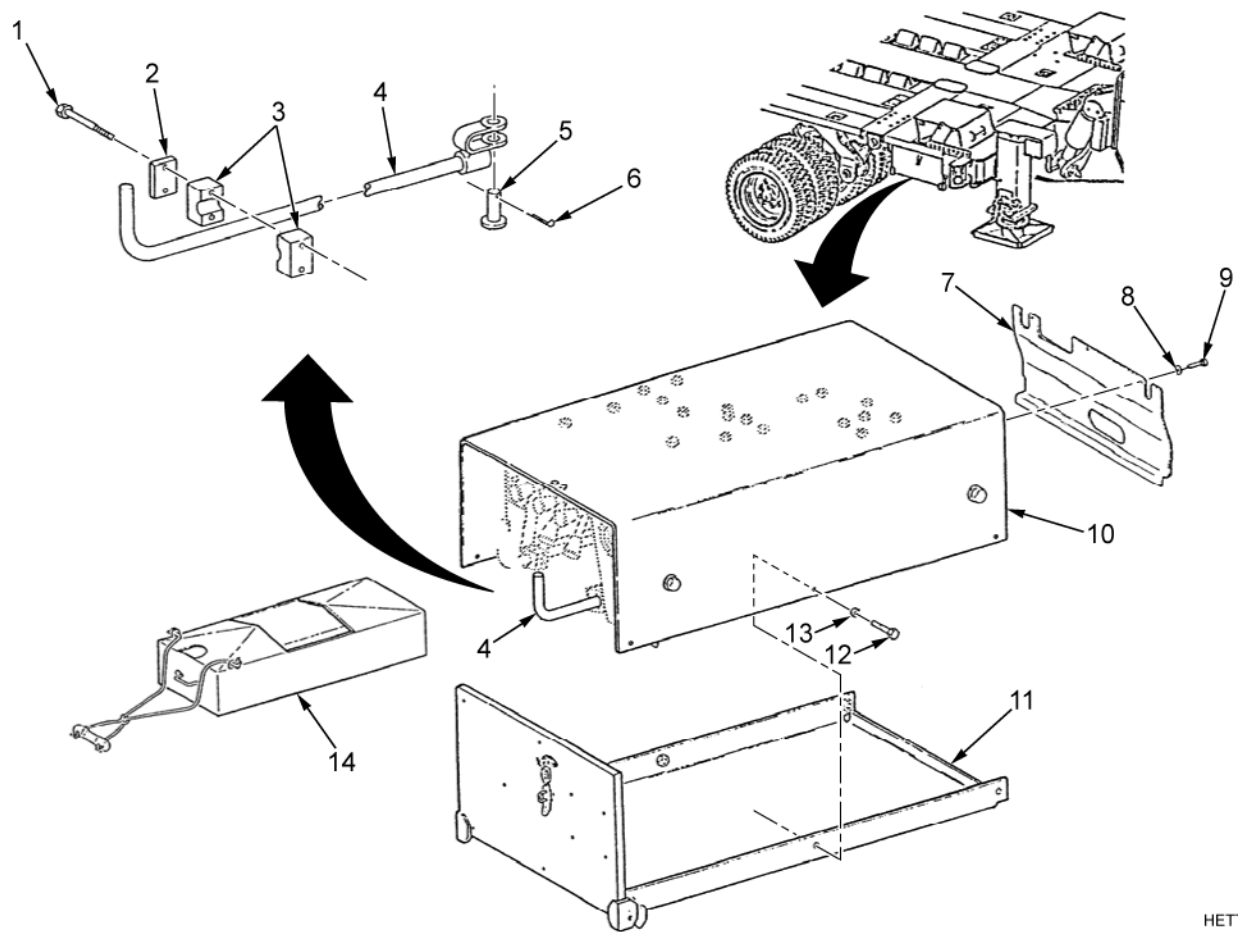
REMOVAL

WARNING

- Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, and goggles or face shield. If hydraulic fluid gets in eyes, flush eyes immediately with water and seek medical attention. If hydraulic fluid gets on skin, wash thoroughly with soap and water. Wash hands thoroughly prior to eating or smoking.
- Hydraulic fluid may be hot if system has been in operation. Allow system to cool before performing maintenance.
- Residual pressure may remain in hydraulic lines. Open fittings slowly.
- The hydraulic control module, with all components installed, weighs in excess of 300 lb (136 kg). Extreme caution must be used during removal and installation of control module.
- The control module must be supported with a hydraulic transmission jack during removal and installation procedure.

Failure to follow these warnings may result in serious injury or death to personnel or damage to equipment.

1. Use two people to remove six capscrews (Figure 1, Item 12), lockwashers (Figure 1, Item 13), and bottom cover assembly (Figure 1, Item 11) from hydraulic control module frame (Figure 1, Item 10). Discard lockwashers.
2. Pull gooseneck isolation valve handle (Figure 1, Item 4) outward to ADJUST position. Remove cotter pin (Figure 1, Item 6) and shouldered pin (Figure 1, Item 5) from gooseneck isolation valve handle. Discard cotter pin.
3. Remove two screws (Figure 1, Item 1), spacer (Figure 1, Item 2), block clamp (Figure 1, Item 3), and gooseneck isolation valve handle (Figure 1, Item 4) from hydraulic control module frame (Figure 1, Item 10).
4. Remove three screws (Figure 1, Item 9), lockwashers (Figure 1, Item 8), and rear cover (Figure 1, Item 7) from hydraulic control module frame (Figure 1, Item 10). Discard lockwashers.
5. Place drain pan (Figure 1, Item 14) under hydraulic control module frame (Figure 1, Item 10).



HETT0641

Figure 1. Hydraulic Control Module Cover Removal.

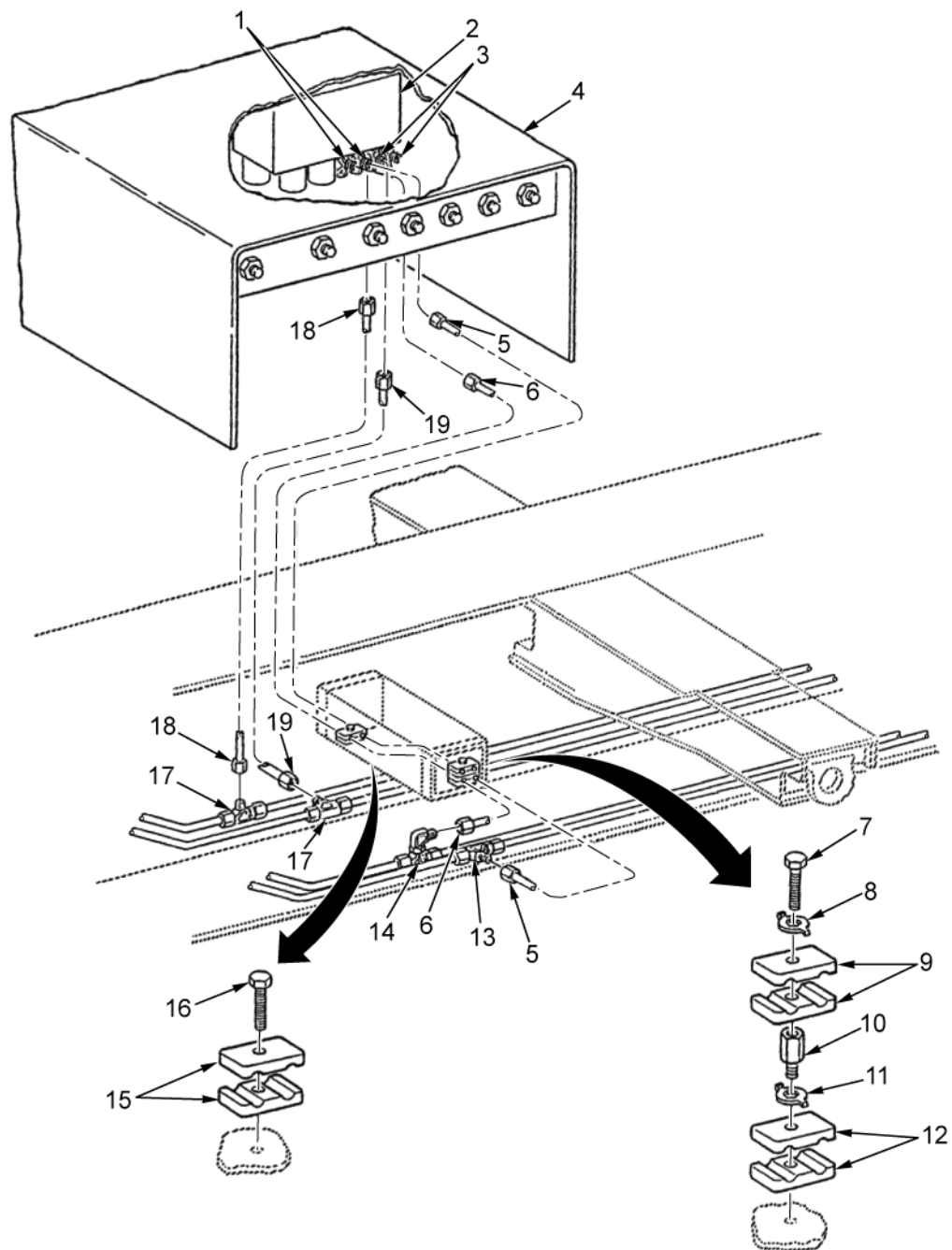
CAUTION

- **Metallic tubes must have both ends loosened before the tube can be moved. Failure to follow this caution may result in damage to equipment.**
 - **All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or foreign material from entering the hydraulic system. Failure to follow this caution may result in damage to equipment.**
6. Tag and remove two hydraulic tubes (Figure 2, Item 18 and Item 19) from tube tees (Figure 2, Item 1 and Item 17) on steering control manifold (Figure 2, Item 2). Install caps/plugs into tube and fitting openings.
 7. Remove capscrew (Figure 2, Item 16) and both sections of block clamp (Figure 2, Item 15) from two hydraulic tubes (Figure 2, Item 5 and Item 6). Remove capscrew (Figure 1, Item 7), retainer (Figure 2, Item 8), both sections of block clamp (Figure 2, Item 9), stacking bolt (Figure 2, Item 10), retainer (Figure 2, Item 11), and both sections of block clamp (Figure 2, Item 12) from two hydraulic tubes.
 8. On streetside of platform, between platform storage compartment and mainbeam, tag and disconnect two hydraulic tubes (Figure 2, Item 5 and Item 6) from swivel tube elbow (Figure 2, Item 14) and tube tee (Figure 2, Item 13). Tag and disconnect two hydraulic tubes from two tube tees (Figure 2, Item 3) on steering control manifold (Figure 2, Item 2). Install caps/plugs into tube and fitting openings.

NOTE

To lower the hydraulic control module frame, move the two hydraulic tubes out of the way of the hydraulic control module frame. There is little clearance to remove tubes from platform with the platform storage compartment installed.

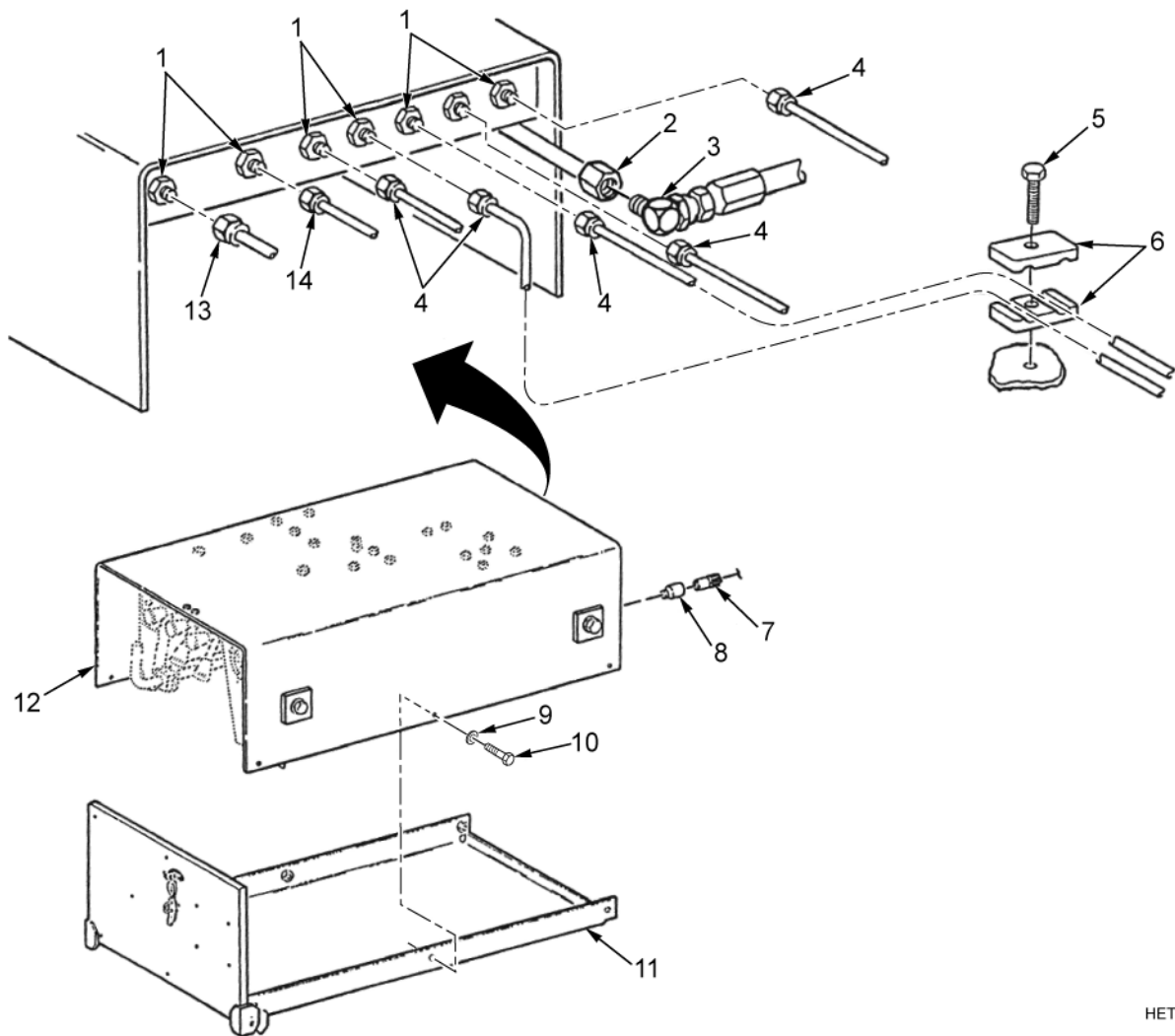
9. Carefully move two hydraulic tubes (Figure 2, Item 5 and Item 6) out of the way of hydraulic control module frame (Figure 2, Item 4). Tubes should be moved inward toward mainbeam.



HETT0647

Figure 2. Hydraulic Control Module Frame Tube Removal.

10. Remove capscrew (Figure 3, Item 5) and both sections of block clamp (Figure 3, Item 6) from opening in platform mainbeam.
11. Tag and disconnect five hydraulic tubes (Figure 3, Item 4) from bulkhead fittings (Figure 3, Item 1). Loosen other end of each tube so that tubes may be moved slightly and caps/plugs can be installed. Carefully move lines and install caps/plugs into openings.
12. Tag and disconnect hydraulic tube (Figure 3, Item 14) and hydraulic hose (Figure 3, Item 13) from bulkhead fittings (Figure 3, Item 1). Loosen other end of each tube so that tubes and hose can be moved slightly and caps/plugs installed. Carefully move lines and install caps/plugs into openings.
13. Use 1 1/4 in. combination wrench to tag and disconnect hydraulic tube (Figure 3, Item 2) from tube elbow (Figure 3, Item 3). Install caps/plugs into openings. Move drain pan out from under platform.
14. Tag and disconnect electrical connector (Figure 3, Item 7) from electrical lead (Figure 3, Item 8).
15. Use two people to install bottom cover assembly (Figure 3, Item 11) onto hydraulic control module frame (Figure 3, Item 12). Secure cover in place by installing six capscrews (Figure 3, Item 10) and lockwashers (Figure 3, Item 9). Close and secure hinged cover of bottom cover assembly.



HETT0642

Figure 3. Hydraulic Control Module Frame Electrical Disconnect.

NOTE

Center of gravity for hydraulic control module frame is approximately the center of the assembly (both side to side and front to back).

16. Position hydraulic transmission jack (Figure 4, Item 8) centered under hydraulic control module frame (Figure 4, Item 6). Operate hydraulic transmission jack until jack makes firm contact with bottom cover assembly (Figure 4, Item 7).
17. Remove three screws (Figure 4, Item 1) and lockwashers (Figure 4, Item 2) from hydraulic control module frame (Figure 4, Item 6). Discard lockwashers.

CAUTION

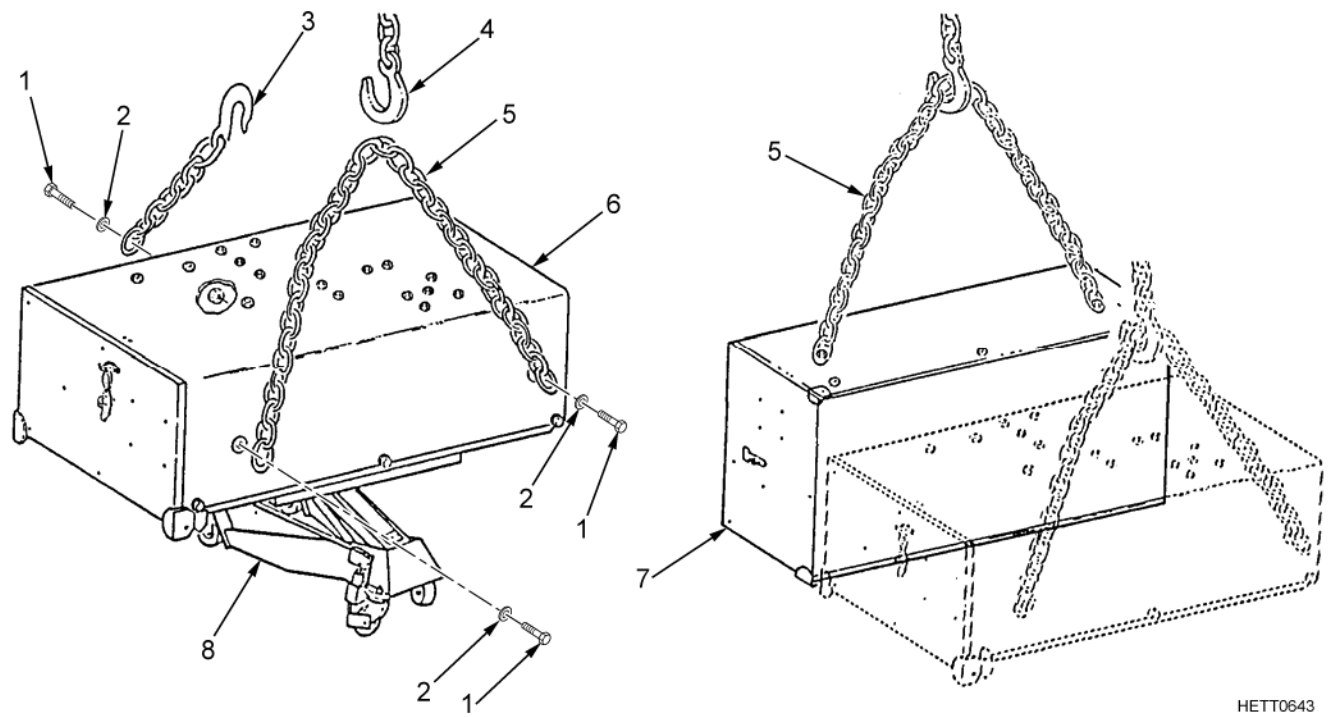
When lowering transmission jack, ensure hydraulic lines do not catch on hydraulic control module. Failure to follow this caution may result in damage to equipment.

18. Lower hydraulic transmission jack (Figure 4, Item 8) until hydraulic control module frame (Figure 4, Item 6) is clear of semitrailer platform.
19. Use two people to carefully pull hydraulic transmission jack (Figure 4, Item 8) and hydraulic control module frame (Figure 4, Item 6) out from under and clear of platform.
20. Position overhead lifting device (Figure 4, Item 4) over hydraulic control module frame (Figure 4, Item 6). Install 24 in. hooked chain (Figure 4, Item 3) on hydraulic control module frame side with only one mounting hole. Secure chain in place by installing capscrew (Figure 4, Item 1) and lockwasher (Figure 4, Item 2).
21. Install 62 in. hooked chain (Figure 4, Item 5) on hydraulic control module frame (Figure 4, Item 6) side with two mounting holes. Secure chain in place by installing two capscrews (Figure 4, Item 1) and lockwashers (Figure 4, Item 2).
22. Connect hook on chain (Figure 4, Item 3) to center of chain (Figure 4, Item 5). Attach overhead lifting device (Figure 4, Item 4) to both chains. Take up slack in lifting device.
23. Lift hydraulic control module frame (Figure 4, Item 6) off of hydraulic transmission jack (Figure 4, Item 8). Move hydraulic transmission jack clear of hydraulic control module frame. If necessary, use overhead lifting device (Figure 4, Item 4) to transport hydraulic control module frame to clear area (or shop bench) for further maintenance.
24. Lower lifting device (Figure 4, Item 4) and place hydraulic control module frame (Figure 4, Item 6) firmly on ground or work bench area. Lower lifting device and unhook hook end of chain (Figure 4, Item 3) from chain (Figure 4, Item 5). Allow chain to hang and take up slack in lifting device.

CAUTION

Ensure that there is enough room for the hydraulic control module frame to be rolled. Failure to follow this caution may result in damage to the equipment.

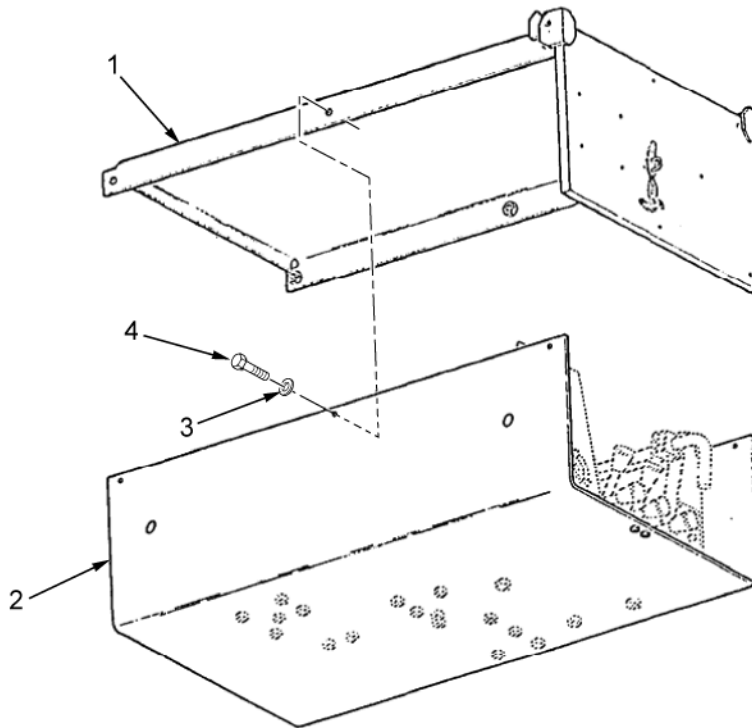
25. Clear work area to ensure that hydraulic control module frame (Figure 4, Item 6) has enough space to be rolled over.
26. Operate lifting device (Figure 4, Item 4) and start to lift side of hydraulic control module frame (Figure 4, Item 6). Continue to operate lifting device until frame has rolled over onto its side.
27. Continue to reposition lifting device (Figure 4, Item 4) and roll hydraulic control module frame (Figure 4, Item 6) until frame has rolled off its side and onto its top. Ensure that hydraulic control module frame is resting firmly on flat surface.
28. Remove three capscrews (Figure 4, Item 1) and lockwashers (Figure 4, Item 2), and remove 24 in. chain (Figure 4, Item 3) and 62 in. chain (Figure 4, Item 5) from hydraulic control module frame (Figure 4, Item 6) and lifting device (Figure 4, Item 4).



HETT0643

Figure 4. Hydraulic Control Module Frame Removal.

29. Lower door on bottom cover assembly (Figure 5, Item 1) and remove six capscrews (Figure 5, Item 4) and lockwashers (Figure 5, Item 3). Use two people to remove bottom cover assembly from hydraulic control module frame (Figure 5, Item 2).



HETT0644

Figure 5. Bottom Cover Assembly Removal.

30. Disassemble hydraulic control module frame by removing the following:

- a. Hydraulic control module jumper wires (WP 0057)
- b. Steering pressure indicator light (WP 0051)
- c. Four-way directional control manifold (WP 0108)
- d. Suspension control manifold (WP 0110)
- e. Suspension shutoff valve (WP 0114)
- f. Steering control manifold (WP 0109)
- g. Hydraulic pressure gauges (WP 0119)
- h. Hydraulic filter (WP 0120)
- i. Data plates (WP 0106)

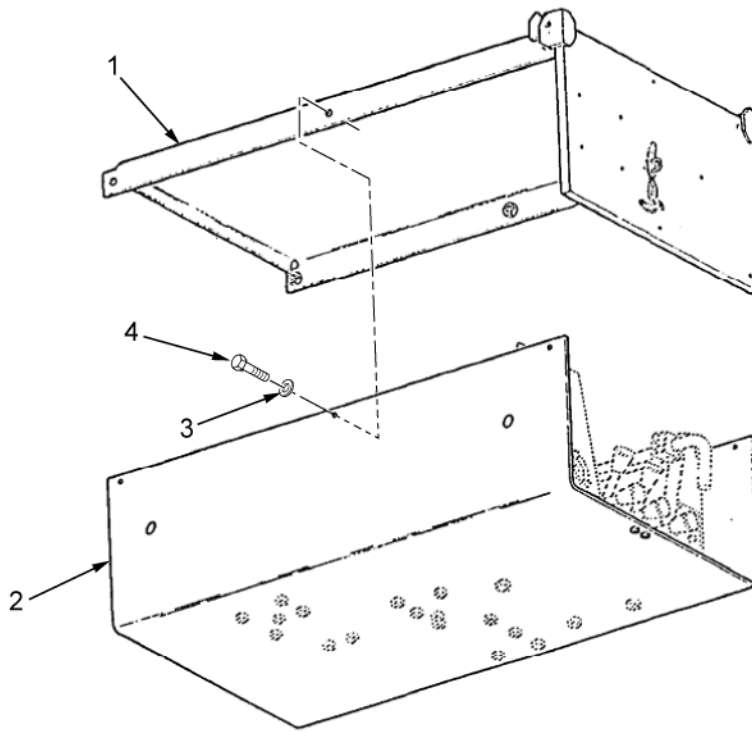
31. Assemble hydraulic control module frame by installing the following:

- a. Data plates (WP 0106)
- b. Hydraulic filter (WP 0120)
- c. Hydraulic pressure gauges (WP 0119)
- d. Steering control manifold (WP 0109)
- e. Suspension shutoff valve (WP 0114)
- f. Suspension control manifold (WP 0110)
- g. Four-way directional control manifold (WP 0108)
- h. Steering pressure indicator light (WP 0051)
- i. Hydraulic control module jumper wires (WP 0057)

END OF TASK

INSTALLATION

1. Use two people to install bottom cover assembly (Figure 6, Item 1) onto hydraulic control module frame (Figure 6, Item 2). Secure cover in place by installing six lockwashers (Figure 6, Item 3) and capscrews (Figure 6, Item 4).

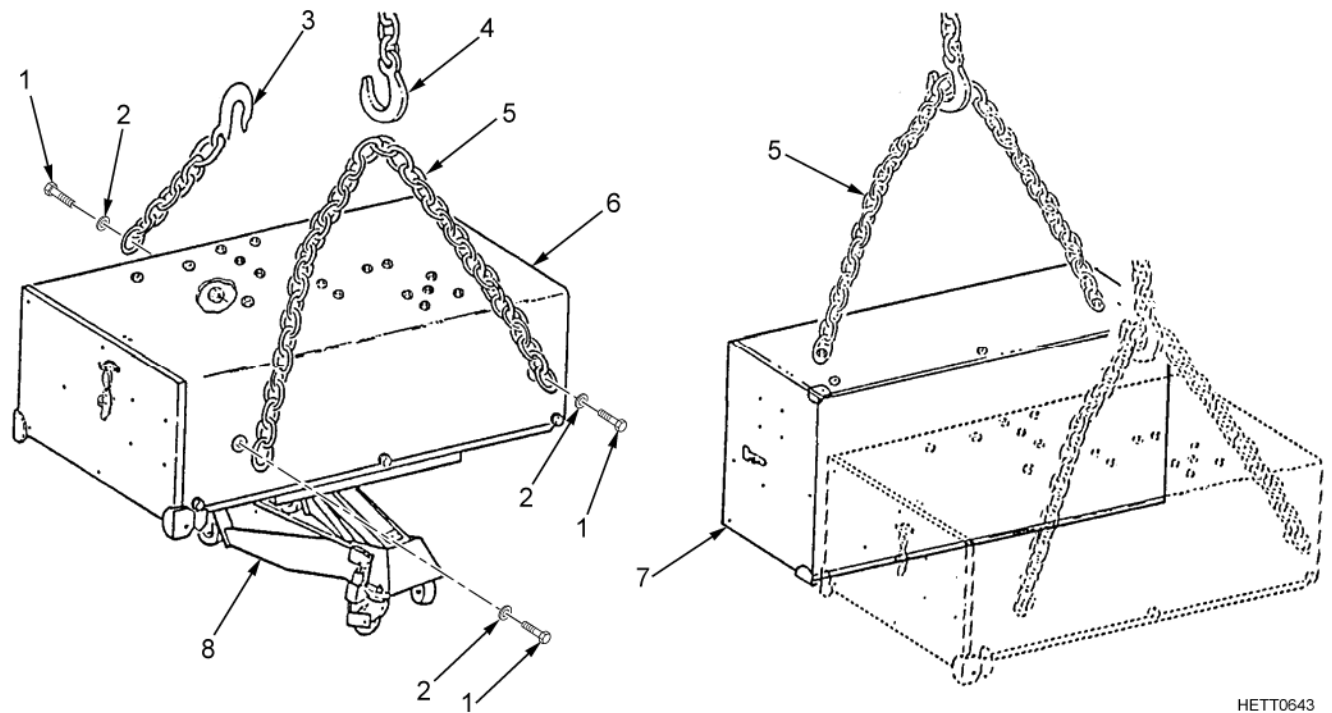


HETT0644

Figure 6. Bottom Cover Assembly.

2. Position overhead lifting device (Figure 7, Item 4) over hydraulic control module frame (Figure 7, Item 6). Install 24 in. hooked chain (Figure 7, Item 3) onto hydraulic control module frame side with only one mounting hole. Secure chain in place by installing capscrew (Figure 7, Item 1) and lockwasher (Figure 7, Item 2).
3. Install 62 in. hooked chain (Figure 7, Item 5) onto hydraulic control module frame (Figure 7, Item 6) side with two mounting holes. Secure chain in place by installing two capscrews (Figure 7, Item 1) and lockwashers (Figure 7, Item 2).
4. Connect lifting device (Figure 7, Item 4) to chain (Figure 7, Item 5) on hydraulic control module frame (Figure 7, Item 6) and lifting device. Take up slack in chain.
5. Operate lifting device (Figure 7, Item 4) and start to pick up one side of hydraulic control module frame (Figure 7, Item 6). Continue to operate lifting device until hydraulic control module frame has rolled over onto its side.
6. Continue to reposition lifting device (Figure 7, Item 4) and roll hydraulic control module frame (Figure 7, Item 6) until hydraulic control module frame has rolled off its side and onto bottom cover assembly (Figure 7, Item 7).
7. Ensure hydraulic control module frame (Figure 7, Item 6) is sitting firmly on bottom cover assembly (Figure 7, Item 7). Lower lifting device (Figure 7, Item 4) and unhook lifting device from chain (Figure 7, Item 5).
8. Connect hook on chain (Figure 7, Item 3) to center of chain (Figure 7, Item 5). Attach overhead lifting device (Figure 7, Item 4) to both chains. Take up slack in lifting device.
9. Raise lifting device (Figure 7, Item 4) and, if necessary, transport hydraulic control module frame (Figure 7, Item 6) near front curbside of platform for installation.

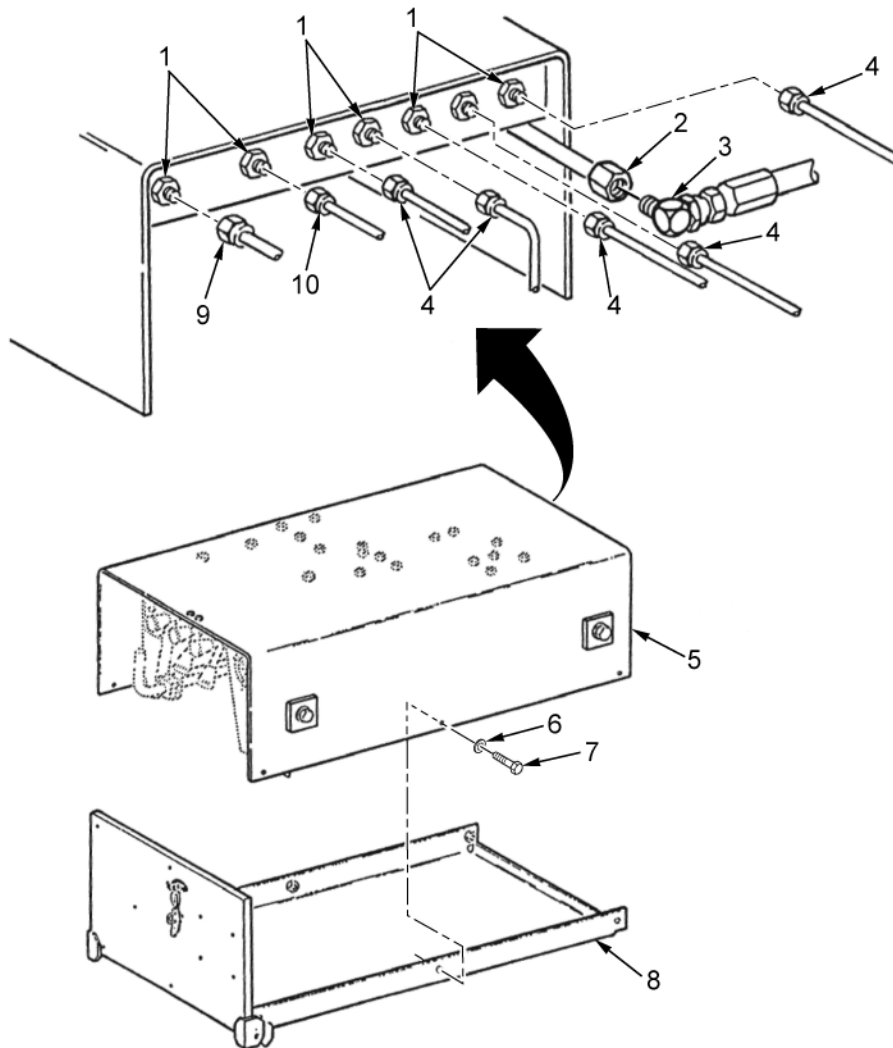
10. Place hydraulic transmission jack (Figure 7, Item 8) near curbside of platform for hydraulic control module frame (Figure 7, Item 6) to be lowered onto. Center lifting device (Figure 7, Item 4) over hydraulic transmission jack and lower hydraulic control module frame onto hydraulic transmission jack.
11. Ensure hydraulic control module frame (Figure 7, Item 6) is sitting firmly on hydraulic transmission jack (Figure 7, Item 8). Lower lifting device (Figure 7, Item 4) and disconnect lifting device from two chains (Figure 7, Item 3 and Item 5). Move lifting device clear of platform and hydraulic control module frame.
12. Remove three capscrews (Figure 7, Item 1), lockwashers (Figure 7, Item 2), and chains (Figure 7, Item 3 and Item 5) from hydraulic control module frame (Figure 7, Item 6). Set chains on top of platform.
13. Use two people to move hydraulic transmission jack (Figure 7, Item 8) and hydraulic control module frame (Figure 7, Item 6) into position under platform. Operate hydraulic transmission jack and raise hydraulic control module frame into alignment with mounting brackets.
14. Install three capscrews (Figure 7, Item 1) and lockwashers (Figure 7, Item 2) to secure hydraulic control module frame (Figure 7, Item 6) in place.
15. Lower hydraulic transmission jack (Figure 7, Item 8) and move hydraulic transmission jack clear of work area.



HETT0643

Figure 7. Hydraulic Control Module Frame Installation.

16. Use two people to remove six capscrews (Figure 8, Item 7), lockwashers (Figure 8, Item 6), and bottom cover assembly (Figure 8, Item 8) from hydraulic control module frame (Figure 8, Item 5).
17. Remove caps/plugs installed and use 1 1/4 in. combination wrench to connect hydraulic tube (Figure 8, Item 2) to tube elbow (Figure 8, Item 3).
18. Remove caps/plugs installed and connect hydraulic tube (Figure 8, Item 10) and hydraulic hose (Figure 8, Item 9) to two bulkhead fittings (Figure 8, Item 1).
19. Remove caps/plugs installed and connect five hydraulic tubes (Figure 8, Item 4) to bulkhead fittings (Figure 8, Item 1).



HETT0646

Figure 8. Hydraulic Control Module Frame Electrical Installation.

20. Remove caps/plugs installed. Use two people to position two hydraulic tubes (Figure 9, Item 13 and Item 15) over swivel tube elbow (Figure 9, Item 16) and tube tee (Figure 9, Item 14) located on streetside of platform. Hold tubes over fittings.
21. Remove caps/plugs installed and connect two hydraulic tubes (Figure 9, Item 13 and Item 15) to two tube tees (Figure 9, Item 3) on steering manifold (Figure 9, Item 4). Hand-tighten both ends of tubes onto fittings.
22. Insert both sections of block clamp (Figure 9, Item 12), retainer (Figure 9, Item 11), stacking bolt (Figure 9, Item 10), both sections of block clamp (Figure 9, Item 9), retainer (Figure 9, Item 8), and capscrew (Figure 9, Item 7) onto two hydraulic tubes (Figure 9, Item 13 and Item 15).
23. Install both sections of block clamp (Figure 9, Item 6) and secure in place with capscrew (Figure 9, Item 5).

24. Insert sections of block clamp (Figure 9, Item 17) onto two hydraulic tubes (Figure 9, Item 13 and Item 15). Temporarily hold block clamp in place by loosely installing capscrew (Figure 9, Item 18). Tighten both ends of two hydraulic tubes. Tighten capscrews to secure block clamps in place.
25. Remove caps/plugs installed and connect two hydraulic tubes (Figure 9, Item 20 and Item 21) between two tube tees (Figure 9, Item 1) on steering manifold (Figure 9, Item 2) and tube tees (Figure 9, Item 19).

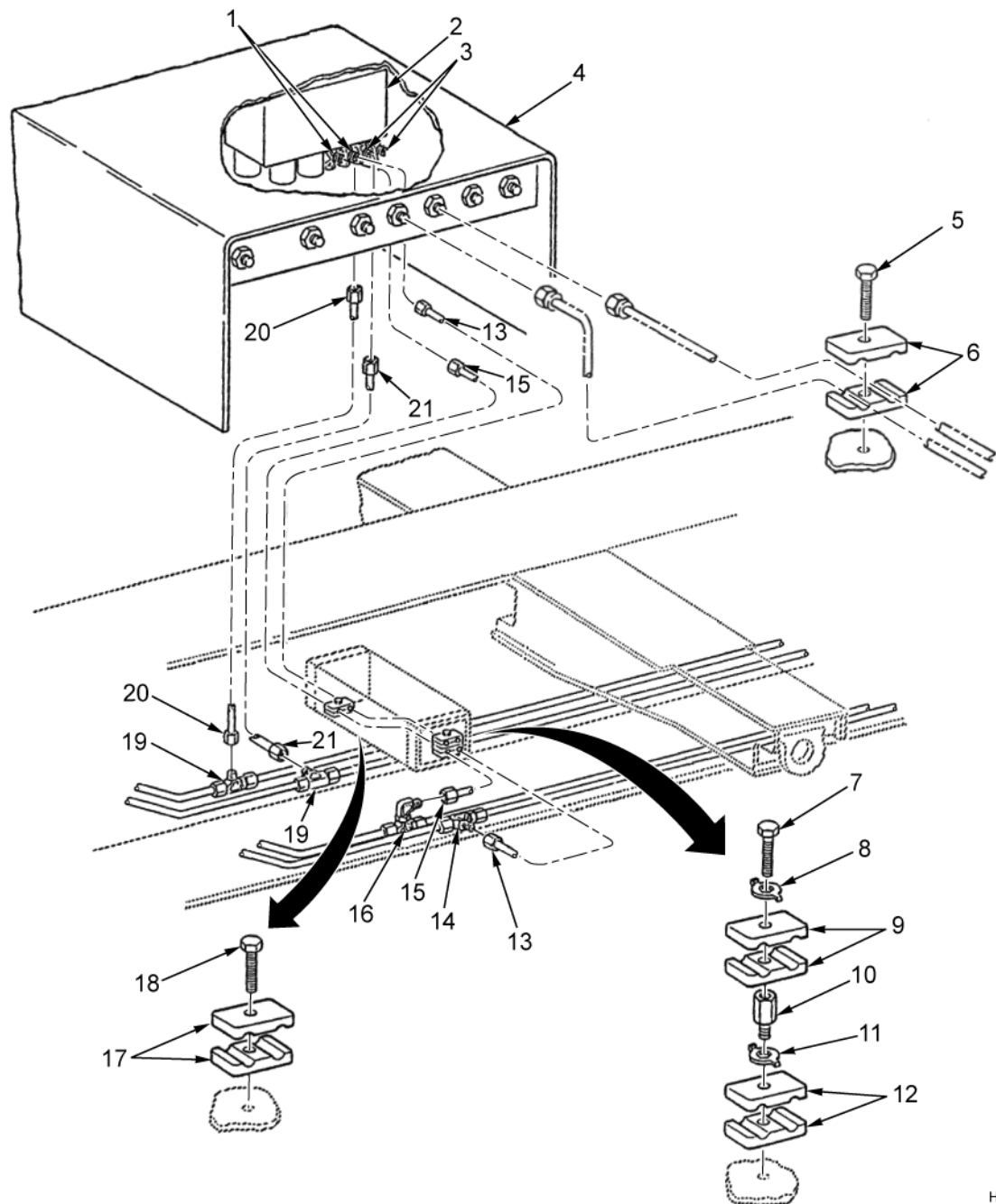
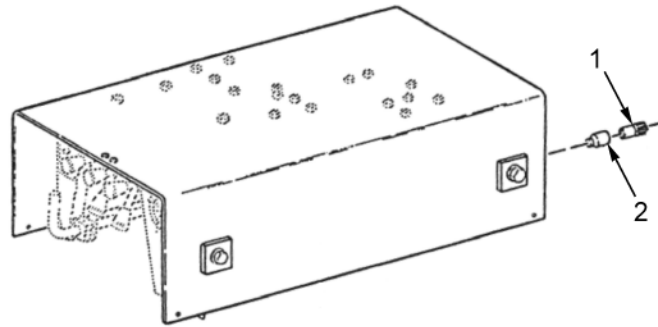


Figure 9. Hydraulic Tube Installation.

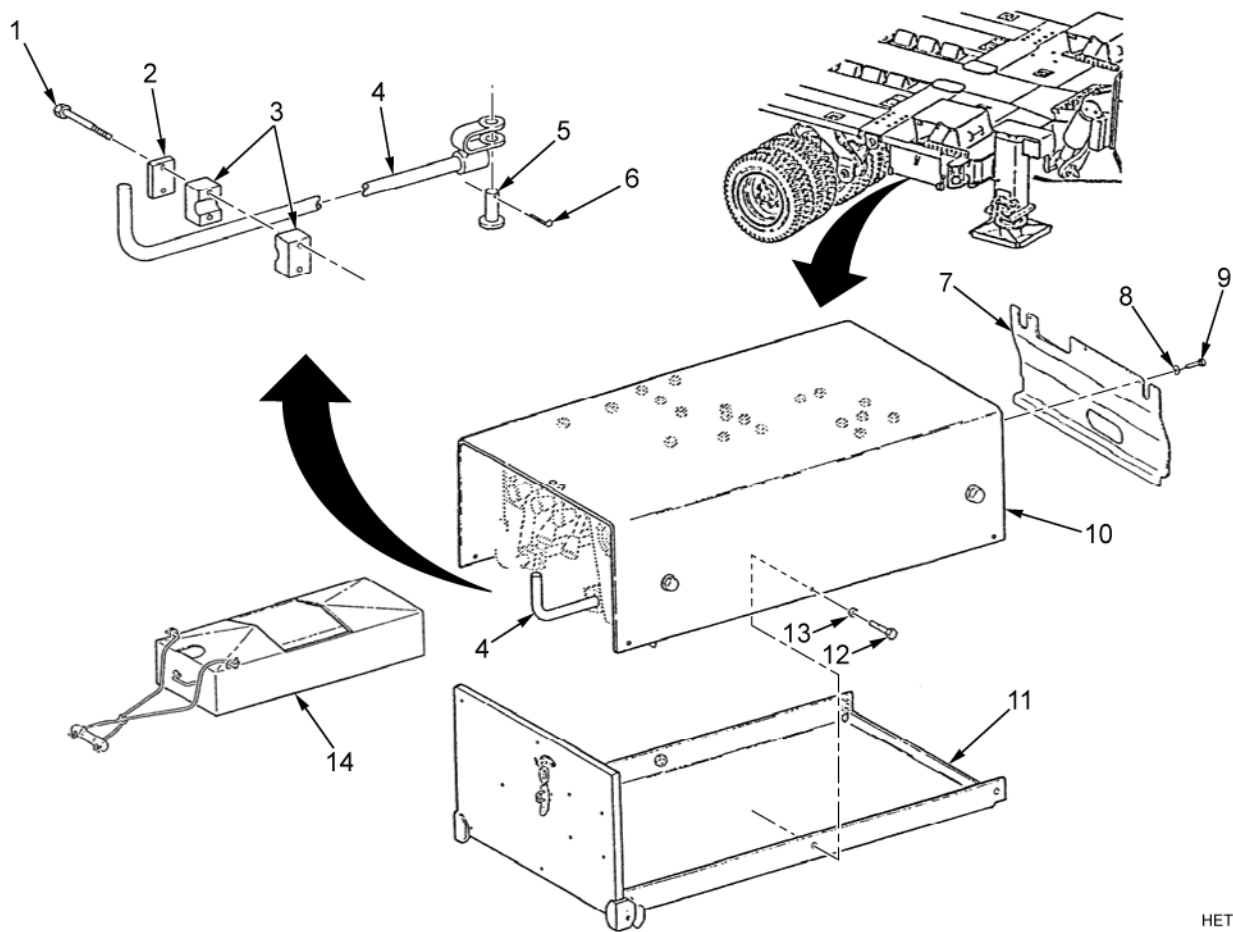
26. Reconnect electrical connector (Figure 10, Item 1) to electrical lead (Figure 10, Item 2).



HETT0936

Figure 10. Electrical Connector and Lead Installation.

27. Install rear cover (Figure 11, Item 7) onto hydraulic control module frame (Figure 11, Item 10) and secure with three screws (Figure 11, Item 9) and lockwashers (Figure 11, Item 8).
28. Install gooseneck isolation valve handle (Figure 11, Item 4) through rear cover (Figure 11, Item 7) and install shouldered pin (Figure 11, Item 5) and cotter pin (Figure 11, Item 6).
29. Align gooseneck isolation valve handle (Figure 11, Item 4) with clamp mount on hydraulic control module frame (Figure 11, Item 10) and secure in place by installing block clamp (Figure 11, Item 3), spacer (Figure 11, Item 2), and two screws (Figure 11, Item 1).
30. Use two people to install bottom cover assembly (Figure 11, Item 11) into place on hydraulic control module frame (Figure 11, Item 10) and secure with six capscrews (Figure 11, Item 12) and lockwashers (Figure 11, Item 13). Remove oil drain pan (Figure 11, Item 14) and discard fluids according to regulations.



HETT0641

Figure 11. Hydraulic Control Module Cover Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

Open hydraulic tank shutoff valve (WP 0004).

Check and fill hydraulic tank as required (WP 0039).

Perform hydraulic system bleeding as required (WP 0041).

Operate hydraulic controls and check for leaks.

END OF WORK PACKAGE

FIELD MAINTENANCE
SNATCH BLOCK SHEAVE BUSHING

INITIAL SETUP:**Tools and Special Tools**

Arbor Press

Personnel Required

1

Materials/Parts

Grease (WP 0170, Item 16)

Equipment Conditions

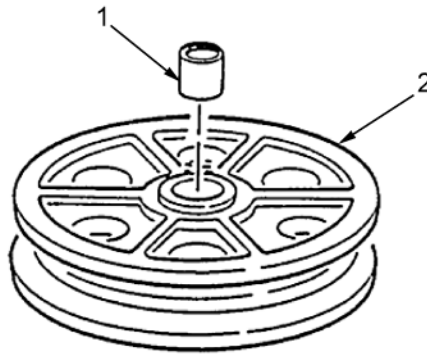
Snatch block disassembled (WP 0103)

GENERAL INFORMATION

This work package contains instructions for removal, lubrication, and installation of the snatch block sheave bushing.

REPAIR OR REPLACEMENT

1. Use arbor press to press bushing (Figure 1, Item 1) from sheave (Figure 1, Item 2).
2. Lubricate outside of bushing with grease.
3. Use arbor press to press bushing (Figure 1, Item 1) into sheave (Figure 1, Item 2) until bushing seats flush with both sides of sheave.



HETT0649

Figure 1. Snatch Block.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**GOOSENECK PIVOT PIN**

INITIAL SETUP:**Tools and Special Tools**

Chain Assy 5/16 in. LK, 46 in. L (4) (WP 0168, Item 7)
Hone, Cylinder 2 in. to 7 in. Portable (WP 0168, Item 9)
General Mechanic's Tool Kit (WP 0168, Item 11)
Lifting Strap (WP 0168, Item 25)
Truck, Wrecker M984 (WP 0168, Item 26)
Standard Army Tool Set (SATS) (WP 0168, Item 28)
3-in. (7.62 cm) Cold Rolled Steel Rod, 66 in. (167.6 cm)
Minimum Length

Materials/Parts

Grease, Automotive and Artillery (WP 0170, Item 16)
Tape, Insulation, Electrical, 0.75-in. wide (WP 0170, Item 31)
Locknut (2) (TM 9-2330-381-24P)
Mount (2) (TM 9-2330-381-24P)
Spacer (3) (TM 9-2330-381-24P)
Spacer (1) (TM 9-2330-381-24P)

Equipment Conditions

Gooseneck hydraulic cylinder removed (WP 0121)
Gooseneck hydraulic lines disconnected from support
step (WP 0118)
Gooseneck pneumatic lines disconnected from support
step (WP 0074)
W1 harness disconnected from platform junction boxes
(WP 0046)
Guardrails removed (WP 0088)
Davit assembly removed (WP 0102)
Spare tires removed if necessary (WP 0046)
Steering wedge centered (WP 0010)
Solar panel removed (some semitrailers) (WP 0054)

Personnel Required

3

REMOVAL**WARNING**

- Gooseneck weighs in excess of 6,200 lb (2815 kg). Be sure gooseneck is adequately supported during removal or injury to personnel may result.
- For lifting purposes, the overhead lifting point for the gooseneck is approximately centered above both gooseneck fairleads. Ensure lifting device is approximately centered, side to side, over the fairleads or injury to personnel and damage to equipment may result.

Failure to follow these warnings may result in severe injury or death to personnel.

CAUTION

Equipment used to support the front of the gooseneck during gooseneck cylinder removal must remain in place during this entire procedure to help support the gooseneck or damage to equipment may result.

1. Ensure existing gooseneck support is firmly supporting gooseneck prior to connecting chains for pivot pin removal.

WARNING

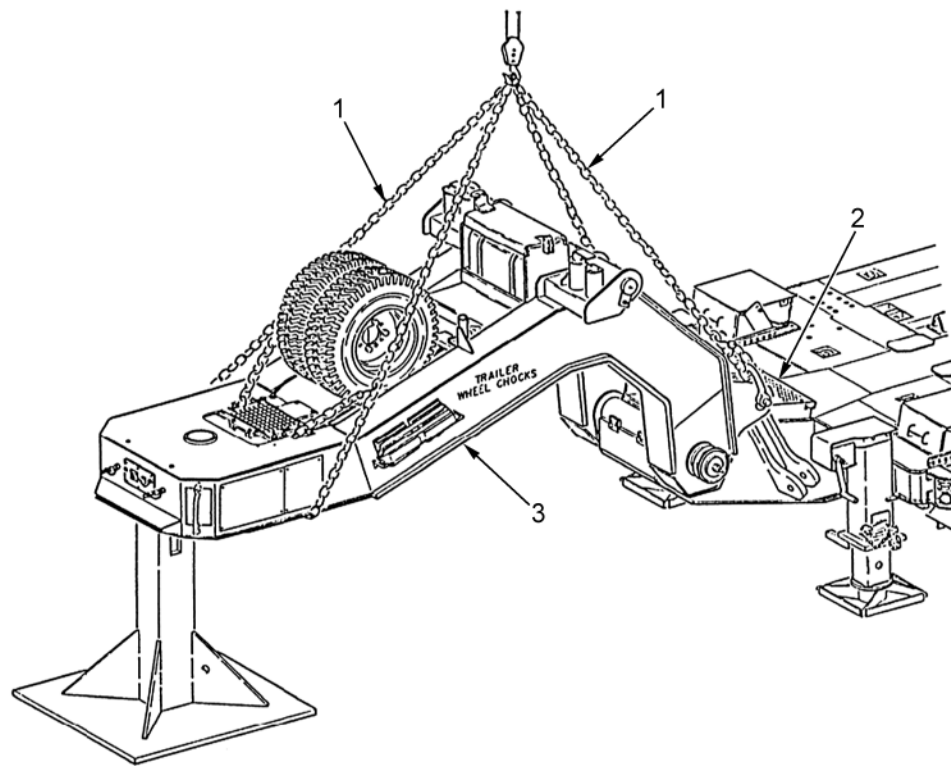
On some semitrailers a solar battery charger is mounted to top of gooseneck directly in front of spare tires. Persons working on top of gooseneck must take **EXTREME** care not to step on or trip over it. Injury to personnel or damage to equipment may result.

Failure to follow this warning may result in severe injury or death to personnel.

CAUTION

An overhead lifting device, four chains, and two clevises will be used to support/transport gooseneck to work area after pivot pin has been removed. Protect gooseneck bracket holes by applying tape to clevises or clevises will damage bracket holes.

2. Using suitable lifting device, four chains (Figure 1, Item 1), two clevises (Figure 1, Item 2), and tape, support gooseneck (Figure 1, Item 3) by attaching one chain (Figure 1, Item 1) and taped clevis (Figure 1, Item 2) through each gooseneck cylinder mounting bracket and two chains through kingpin box weldment adjacent to steering wedge. Take up slack in chains.



HETT0658

Figure 1. Gooseneck/Pivot Pin.

3. Remove four screws (Figure 2, Item 10), two access covers (Figure 2, Item 11), two mounts (Figure 2, Item 12), and two keys (Figure 2, Item 13). Discard mounts.
4. Remove two locknuts (Figure 2, Item 1 and Item 5), two covers (Figure 2, Item 2 and Item 6), and spacer (Figure 2, Item 3). Discard locknuts and spacer.
5. Remove pulley (Figure 2, Item 8) and threaded rod (Figure 2, Item 7) from gooseneck (Figure 2, Item 4).

CAUTION

Use caution not to apply too much tension on lifting chains. Allow only enough tension to support gooseneck or lifting chains will pull against gooseneck pivot pin and complicate removal or damage to equipment may result.

6. Adjust lifting device and chains until gooseneck is level side to side.

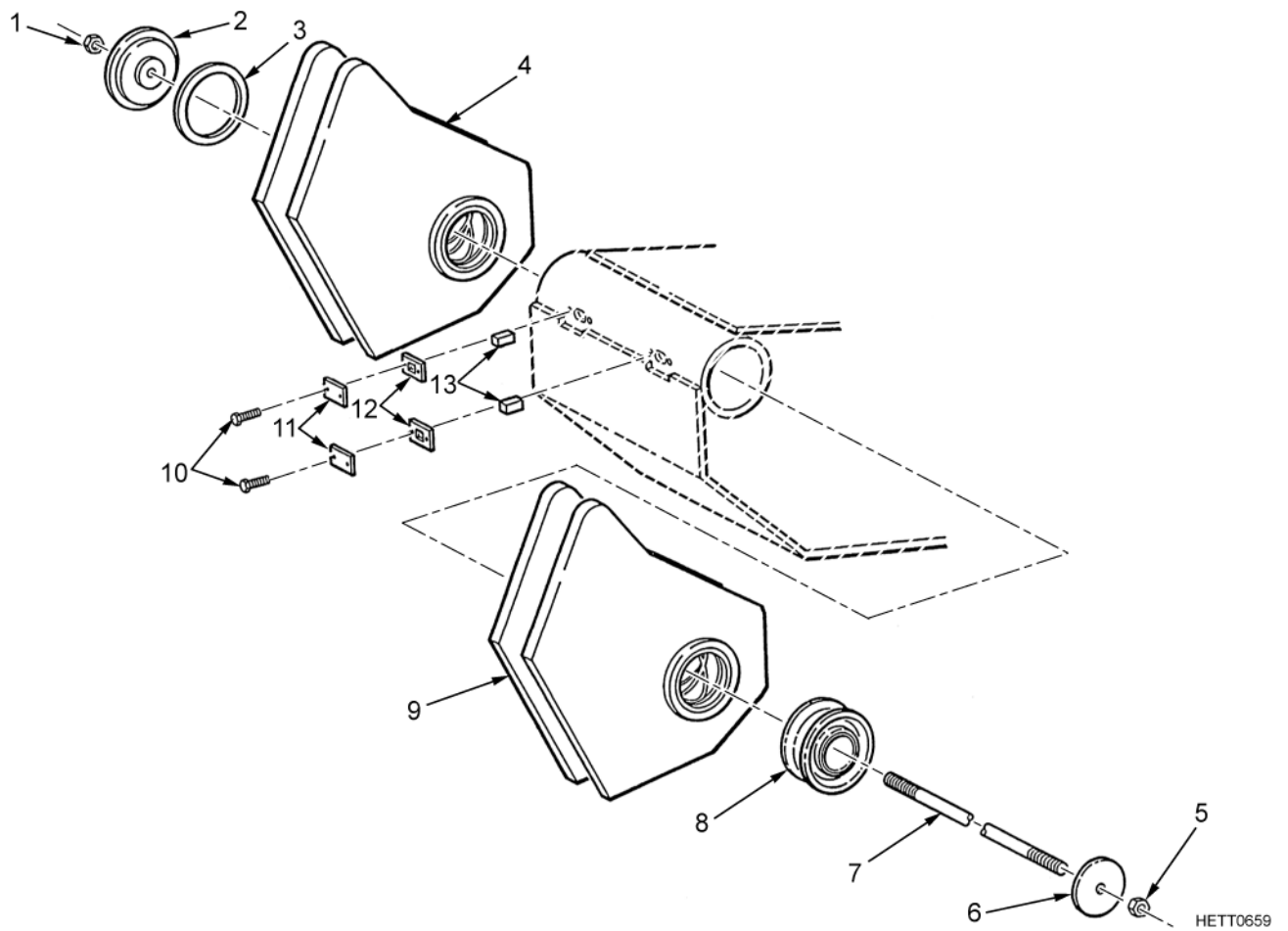
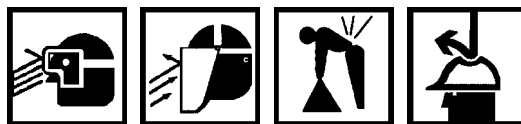


Figure 2. Gooseneck/Pivot Pin.

WARNING

- G{e'trotectiop't'pf 'lceg'tij lgrf u'b wu'dg'y qt p'y j gp 'wulpi 'luggit of 'vq'r'tgxgpv'b gwcitij cxlpi u'qt 'ej k'u'qhib gvcn hitting personnel or injury to personnel may result.
- There should be no slack in chains during removal of gooseneck pivot pins or injury to personnel may result.
- During pivot pin removal, the weight of the gooseneck will be shifted from side to side when each half of the pivot pin is removed. Extra care must be taken to ensure that gooseneck is properly balanced during this procedure or injury to personnel and damage to equipment may result.
- Steel rod is heavy. Two or more persons must be used to handle, support, and drive steel rod or injury to personnel may result.
- Pivot pins can be slick and hard to handle. Care must be exercised when handling or injury to personnel may result.
- DO NOT use sledge hammer while another person is holding steel rod or injury to personnel may result.
- Use safety chain to keep pivot pins from coming out of gooseneck unexpectedly or injury to personnel may result.

Failure to follow these warnings may result in severe injury or death to personnel.

7. At streetside of gooseneck, assemble washer (Figure 3, Item 2) on 3/8-16 screw (Figure 3, Item 1) and insert through 33-in. (83.8 cm) length of chain (Figure 3, Item 7). Install screw (Figure 3, Item 1) into threaded hole in streetside pivot pin (Figure 3, Item 6). Hook free end of chain (Figure 3, Item 7) to gooseneck (Figure 3, Item 4).
8. From curbside of gooseneck, use a 3-in. (7.62 cm) cold-rolled steel round stock, 66 in. (167.6 cm) long, to drive out streetside pivot pin (Figure 3, Item 6) until safety chain (Figure 3, Item 7) is taut. Remove chain (Figure 3, Item 7) and carefully remove streetside pivot pin (Figure 3, Item 6) and three spacers (Figure 3, Item 8, Item 9, and Item 5). Discard spacers.
9. At curbside of gooseneck, assemble washer (Figure 3, Item 2) on 3/8-16 screw (Figure 3, Item 1) and insert through 25-in. (63.5 cm) length of chain (Figure 3, Item 7). Install screw (Figure 3, Item 1) into threaded hole in curbside pivot pin (Figure 3, Item 3). Hook free end of chain (Figure 3, Item 7) to gooseneck (Figure 3, Item 4).
10. From streetside of gooseneck, use a 3-in. (7.62 cm) cold-rolled steel round stock, 66-in. (167.6 cm) long, to drive out curbside pivot pin (Figure 3, Item 3) until safety chain (Figure 3, Item 7) is taut. Remove chain (Figure 3, Item 7) and carefully remove curbside pivot pin (Figure 3, Item 3) and spacer (Figure 3, Item 10). Discard spacer.
11. Separate gooseneck from platform and move gooseneck to work area.

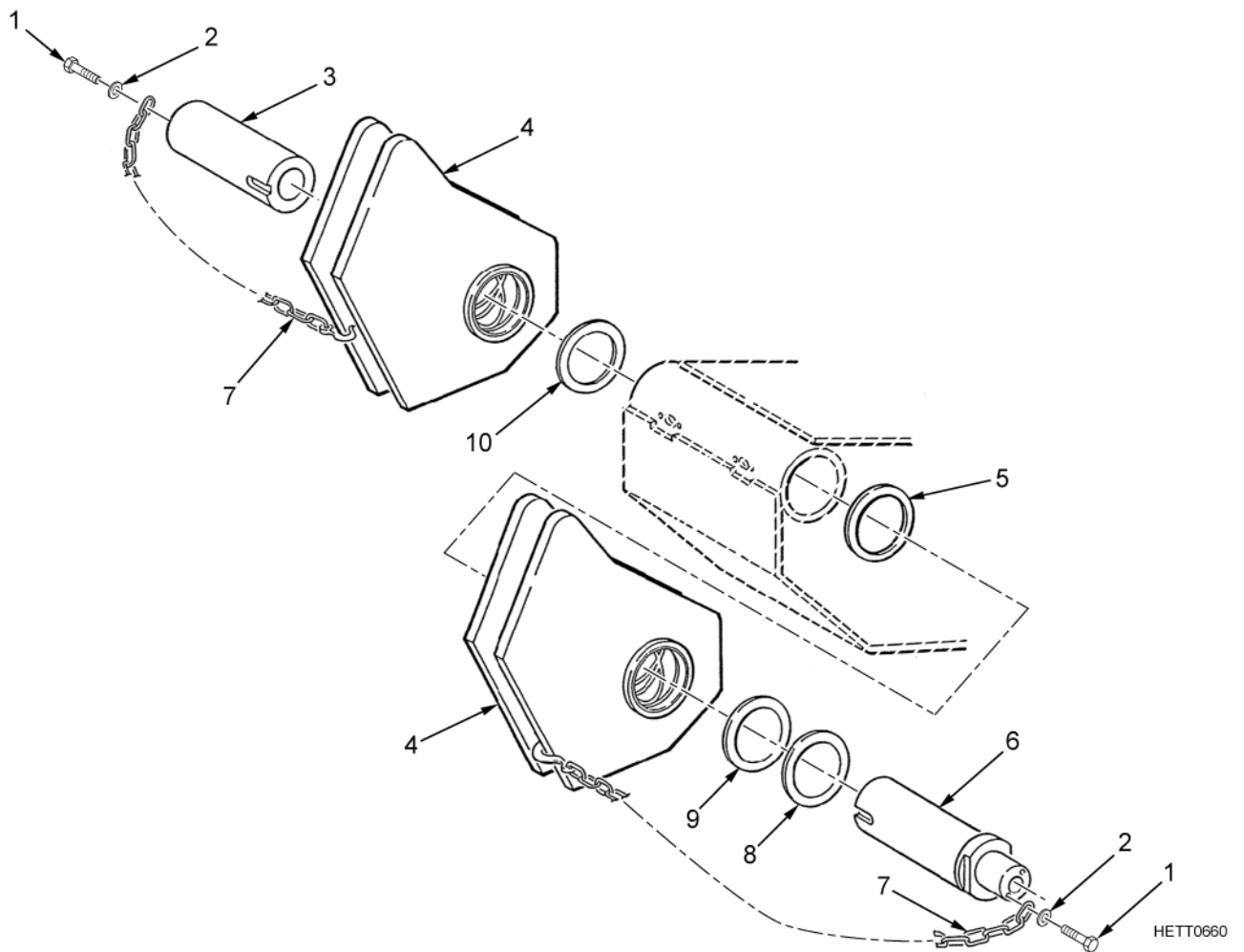


Figure 3. Gooseneck/Pivot Pin.

END OF TASK

REPAIR

1. Clean pivot pins and platform weldment pivot pin bore with rags.
2. Check platform weldment pivot pin bore for pits, scoring, uneven wear, and excess corrosion.
3. Inspect pivot pin bearings in gooseneck for corrosion, uneven wear, and scoring.

CAUTION

Dq'pqv'bmgy 'j qpg'q'ew'ij g'dgctkpi 'ecxk' 'lwtlregr'qt 'ecxk' 'b c' 'dgeo g'vq'icti g'cpf 'tgumw'lp'rtgo cwtg pivot pin failure.

4. Clean pivot pin bore using a drill motor, cylinder hone, and cutting oil. Hone pivot pin cavity to polish inside surfaces only.
5. If bearings are scored or slightly corroded, clean inside bearing surfaces using a power drill and cylinder hone. Hone bearing cavity to polish inside surfaces only. If bearings are unevenly worn, pitted, or defective, replace bearings as follows:
 - a. Use a hammer and brass drift to drive old bearings (Figure 4, Item 1) out of bearing cavity (Figure 4, Item 3) and gooseneck (Figure 4, Item 2).

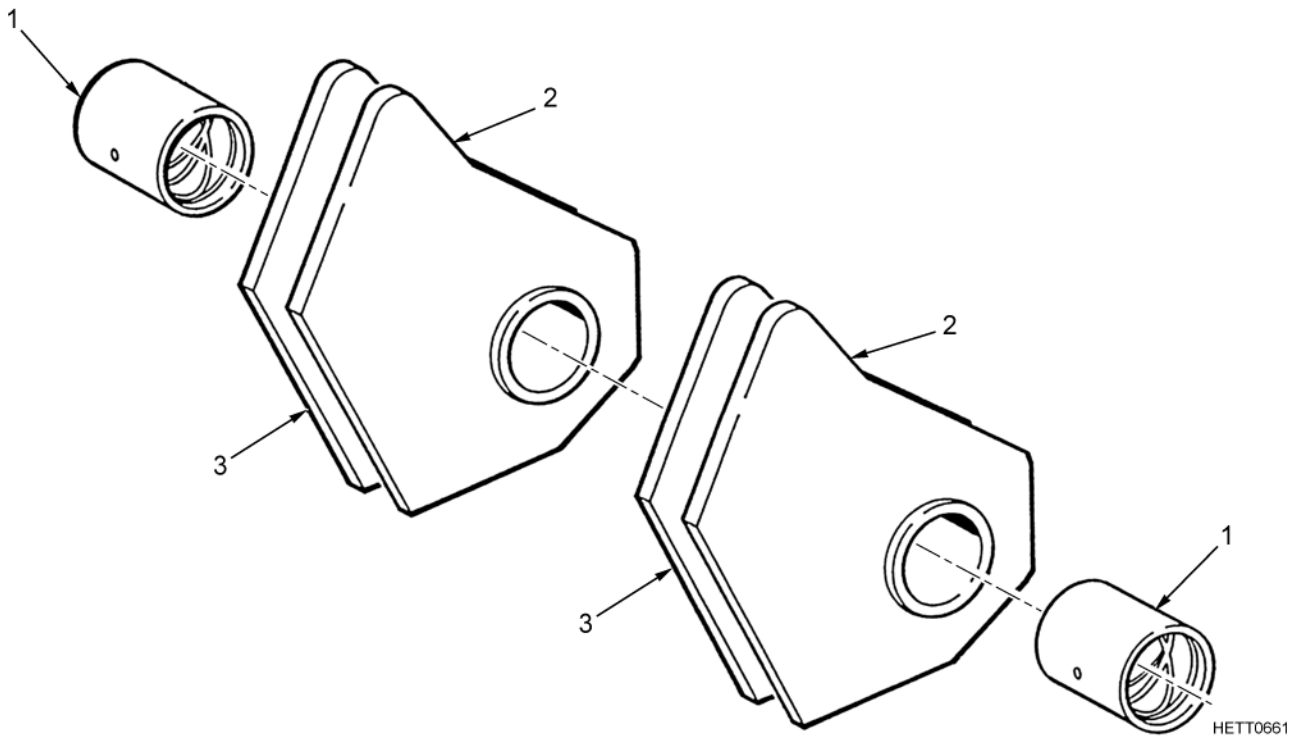
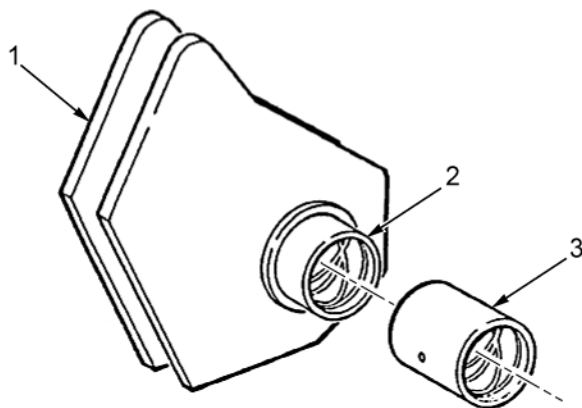


Figure 4. Gooseneck/Pivot Pin.

- b. Use a drill motor and cylinder hone to hone bearing cavity in gooseneck. Hone gooseneck bearing cavity to polish inside surface only.
- c. Align new bearings with bore in gooseneck. Use old bearing (Figure 5, Item 3) and hammer to drive new bearings (Figure 5, Item 2) into gooseneck (Figure 5, Item 1) by hammering against old bearing.



HETT0662

Figure 5. Gooseneck/Pivot Pin.

END OF TASK

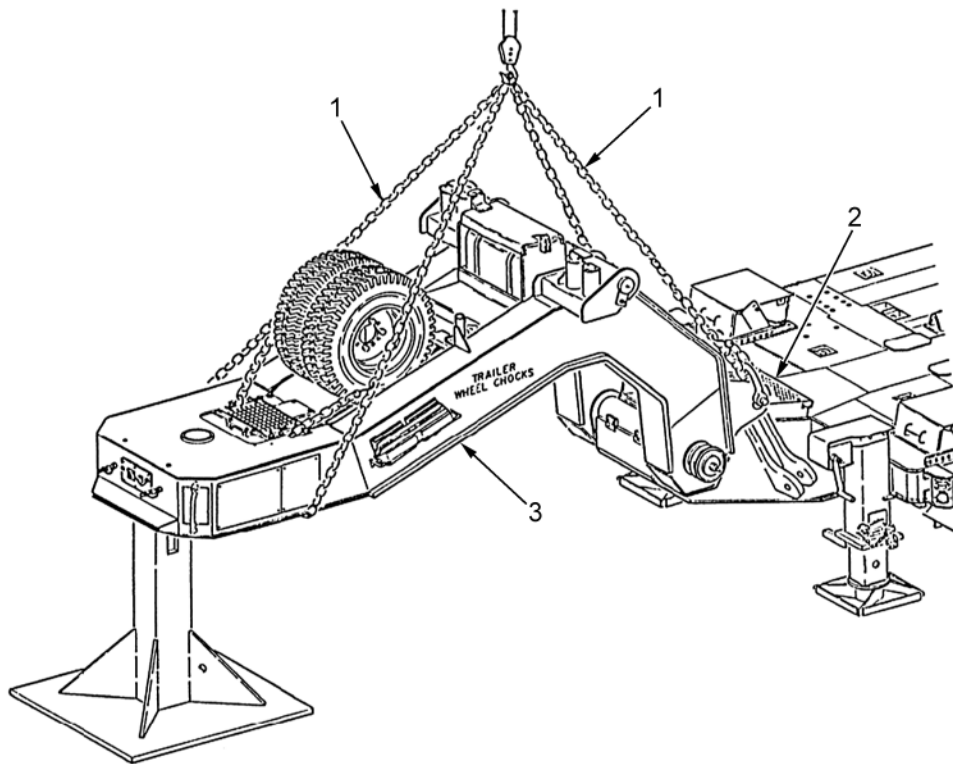
INSTALLATION

WARNING

- Gooseneck weighs in excess of 6,200 lb (2815 kg). Be sure gooseneck is adequately supported during removal or injury to personnel may result.
- **DO NOT** allow personnel under gooseneck until one pivot pin has engaged platform or injury to personnel may result.

Failure to follow this warning may result in severe injury or death to personnel.

1. Using suitable lifting device with chains (Figure 6, Item 1) and clevises (Figure 6, Item 2) still attached to carefully position gooseneck (Figure 6, Item 3) over platform and align holes in gooseneck to holes in platform.



HETT0658

Figure 6. Gooseneck/Pivot Pin.

2. Apply grease to inner surfaces of bearing (Figure 7, Item 4), exterior of curbside pivot pin (Figure 7, Item 1), and inner surfaces of pivot pin mount in platform.

CAUTION

Hammer against a piece of wood when driving in pivot pin or damage to equipment may result.

NOTE

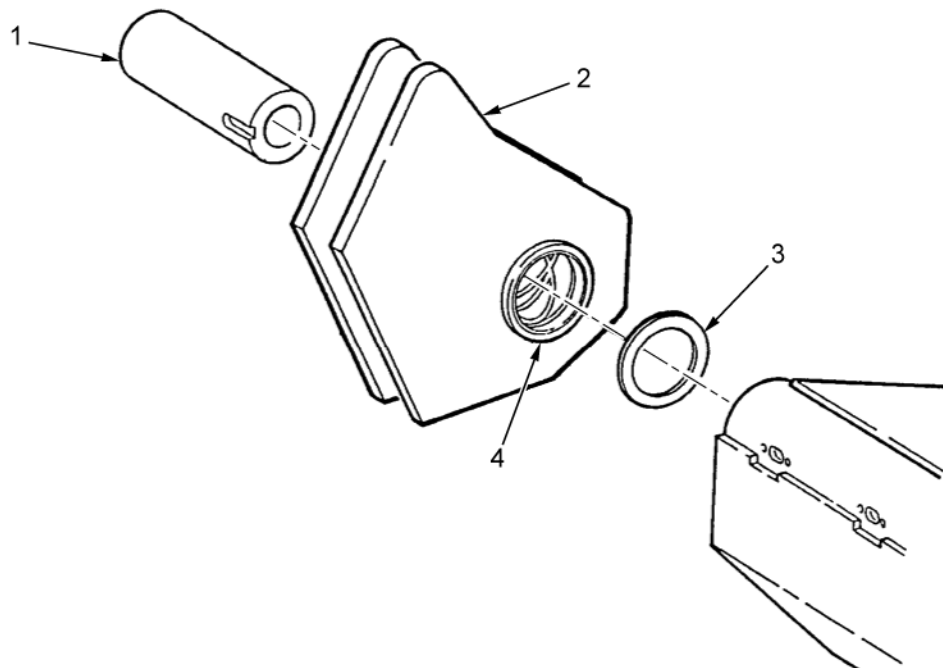
While driving either pivot pin into platform, observe pivot pin through key slots in platform. If pivot pin keyway does not align with key slots in platform or gets rotated during installation, the pivot pin must be removed, realigned, and reinstalled.

3. Ensure keyway in curbside pivot pin (Figure 7, Item 1) is aligned with key slots in platform. Use a sledge hammer and piece of wood to drive curbside pivot pin (Figure 7, Item 1) to inboard edge of bearing (Figure 7, Item 4) on gooseneck (Figure 7, Item 2).

NOTE

Grease will help to hold spacer in place during installation.

4. Apply grease liberally to spacer (Figure 7, Item 3) and install between inboard edge of curbside pivot pin (Figure 7, Item 1) and platform. Ensure spacer (Figure 7, Item 3) is aligned to allow curbside pivot pin (Figure 7, Item 1) to be driven through spacer (Figure 7, Item 3) into platform. Continue driving curbside pivot pin (Figure 7, Item 1) into platform.



HETT0664

Figure 7. Gooseneck/Pivot Pin.

5. Apply grease to inner surfaces of bearing (Figure 8, Item 3) in gooseneck (Figure 8, Item 2), exterior of streetside pivot pin (Figure 8, Item 6), and inner surfaces of pivot pin mount in platform.

NOTE

Spacer (Figure 8, Item 5) is thicker than spacer (Figure 8, Item 4). Spacer (Figure 8, Item 5) goes on pivot pin (Figure 8, Item 6) first.

6. Install spacers (Figure 8, Item 4 and Item 5) onto streetside pivot pin (Figure 8, Item 6). Ensure keyway in streetside pivot pin is aligned with key slots in platform. Use a sledge hammer and piece of wood to drive streetside pivot pin to inboard edge of bearing (Figure 8, Item 3).

NOTE

Grease will help to hold spacer in place during installation.

7. Apply grease liberally to spacer (Figure 8, Item 1) and install between inboard edge of streetside pivot pin (Figure 8, Item 6) and platform. Ensure spacer is aligned to allow streetside pivot pin to be driven through spacer (Figure 8, Item 3) into platform. Continue driving streetside pivot pin into platform.

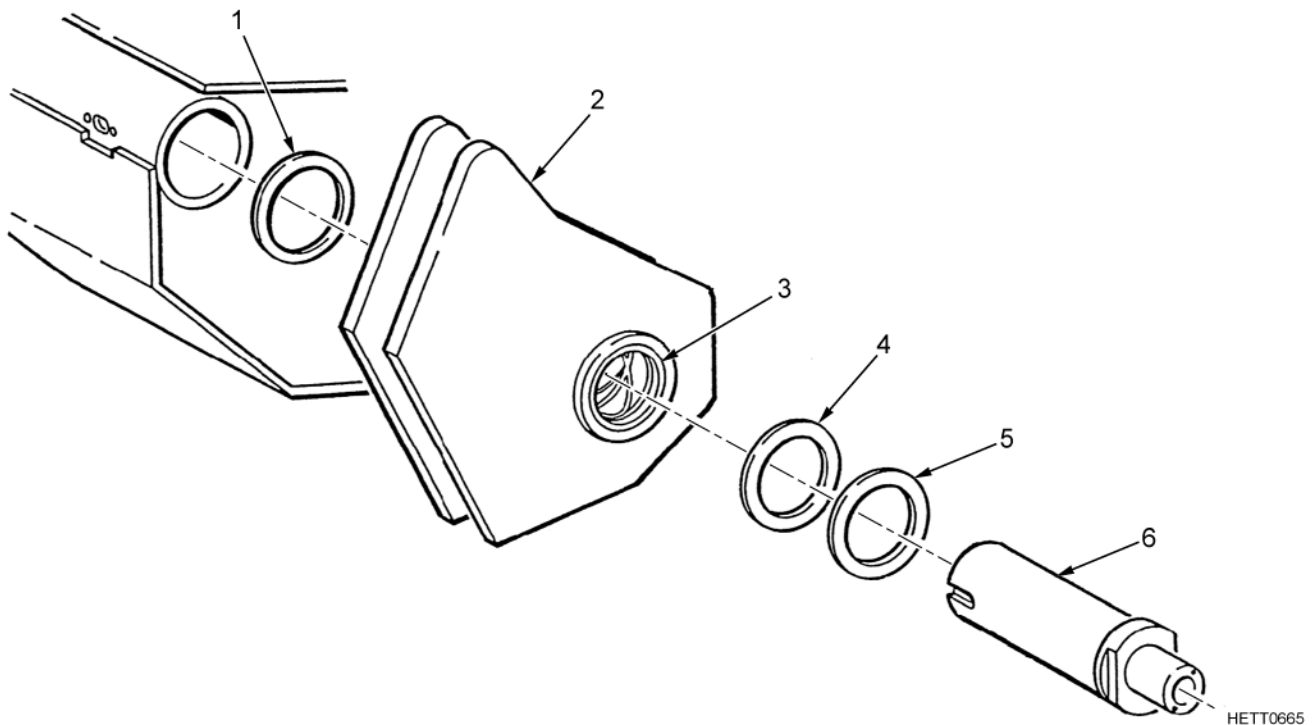


Figure 8. Gooseneck/Pivot Pin.

8. Install two keys (Figure 9, Item 11), mounts (Figure 9, Item 10), access covers (Figure 9, Item 9), and four screws (Figure 9, Item 8) into platform.
9. Install pulley (Figure 9, Item 7) onto pivot pin.
10. Install threaded rod (Figure 9, Item 6) into pivots and platform. Install cover (Figure 9, Item 5), spacer (Figure 9, Item 3), and cover (Figure 9, Item 2) on threaded rod (Figure 9, Item 6).
11. Secure covers (Figure 9, Item 2 and Item 5) in place with two self-locking nuts (Figure 9, Item 1 and Item 4). Torque nuts (Figure 9, Item 1 and Item 4) to 300 lb-ft (407 Nm).

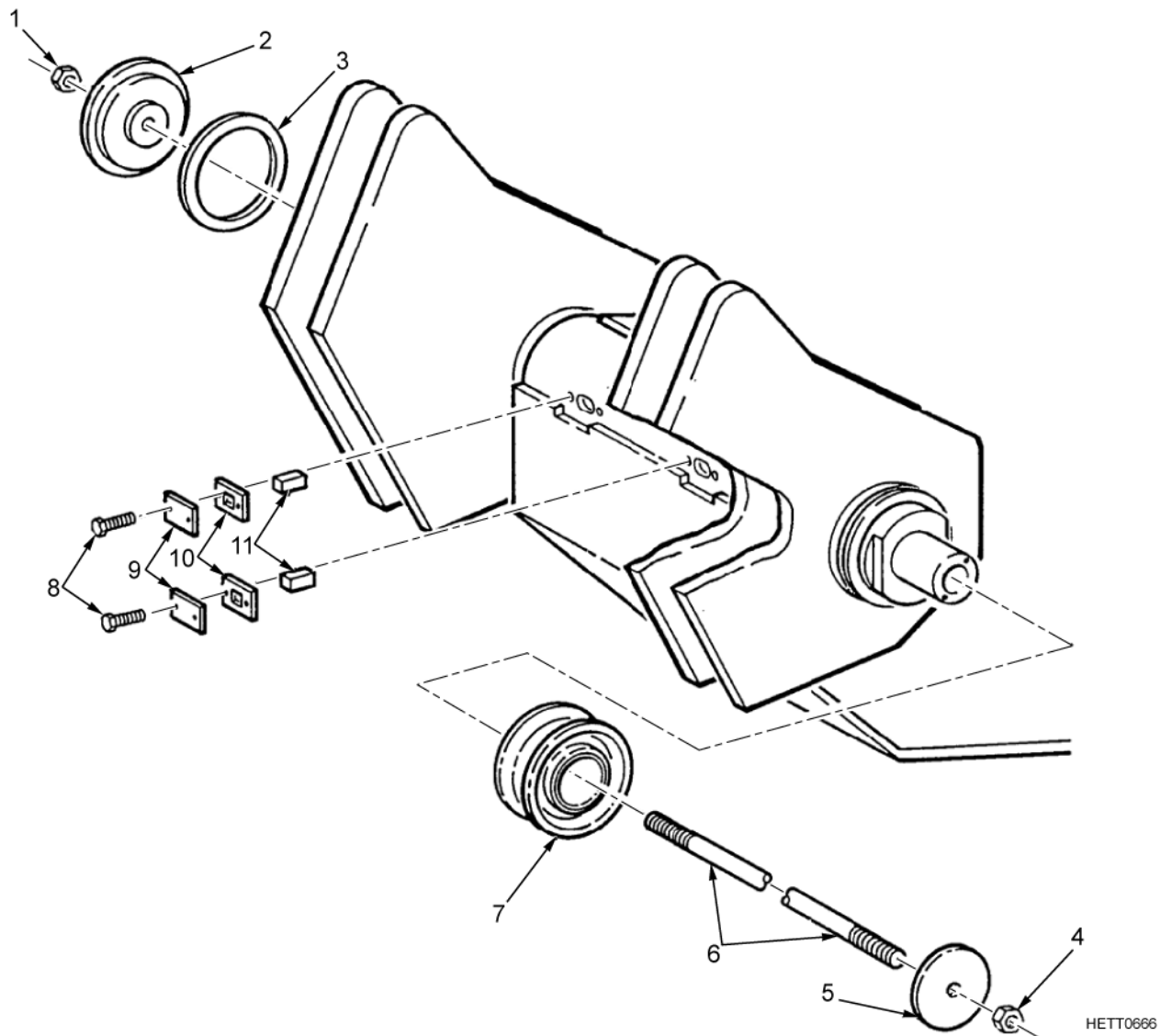


Figure 9. Gooseneck/Pivot Pin.

END OF TASK

FOLLOW-ON MAINTENANCE

Lubricate pivot pin (WP 0163).

Install solar panel (some semitrailers) (WP 0054).

Start APU and check operation of gooseneck/pivot pin installation (WP 0007).

END OF WORK PACKAGE

FIELD MAINTENANCE**FLYWHEEL**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0168, Item 11)
Standard Army Tool Set (SATS) (WP 0168, Item 28)

Personnel Required

1

Materials/Parts

Sealing Compound Thread Locking (WP 0170, Item 25)
Key Washer (1) (TM 9-2330-381-24P)
Lockwasher (3) (TM 9-2330-381-24P)

Equipment Conditions

Auxiliary Power Unit (APU) removed (WP 0128)
Starter removed (WP 0146)
Hydraulic pump removed (WP 0107)

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the flywheel.

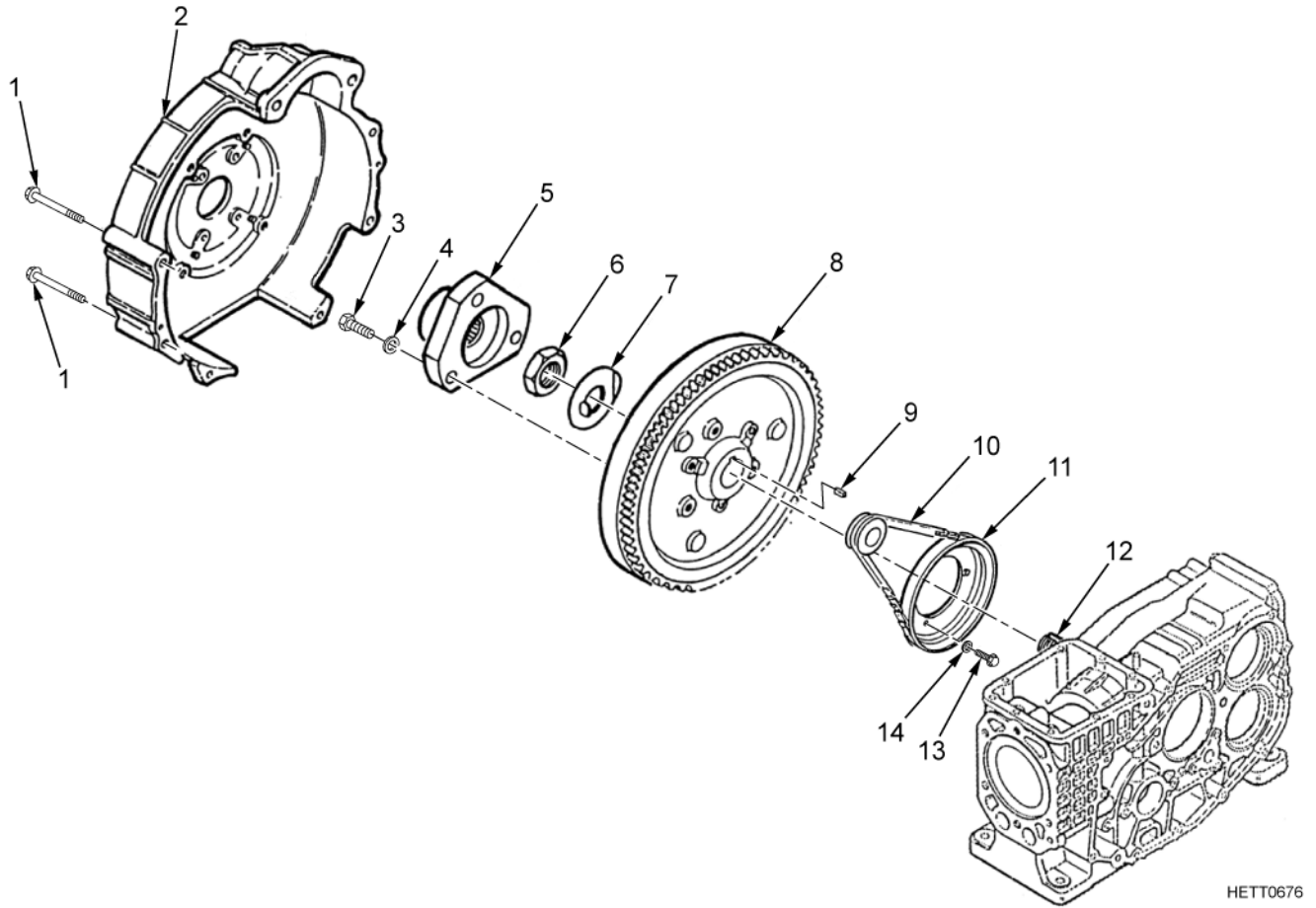
REMOVAL

1. Remove six bolts (Figure 1, Item 1) and flywheel housing (Figure 1, Item 2).
2. Using a block of wood to prevent flywheel from turning, remove three bolts (Figure 1, Item 3), three fender washers (Figure 1, Item 4), and shaft coupling (Figure 1, Item 5).
3. Straighten tab on key washer (Figure 1, Item 7), and using a block of wood to keep the flywheel from turning, remove nut (Figure 1, Item 6) and key washer. Discard key washer.
4. Follow the procedure below to pull flywheel from crankshaft:
 - a. Install nut (Figure 1, Item 6) onto crankshaft (Figure 1, Item 12) so that nut is flush with end of crankshaft.
 - b. Remove three fender washers (Figure 1, Item 4) from pump side of pump adapter (Figure 1, Item 5). Install three fender washers over guide bushings on flywheel side of pump adapter.

NOTE

Three of the four long bolts used to secure the flywheel housing to the engine block are required for the next step.

- c. Using three long bolts, insert bolts (Figure 1, Item 1) through fender washers (Figure 1, Item 4) from flywheel side of pump adapter (Figure 1, Item 5).
 - d. Align pump adapter (Figure 1, Item 5) with end of crankshaft (Figure 1, Item 12). Align and tighten three bolts (Figure 1, Item 1) into flywheel (Figure 1, Item 8), keeping pump adapter even with face of flywheel.
 - e. Using alternating tightening sequence, start to tighten all three bolts (Figure 1, Item 1).
 - f. Continue to tighten all three bolts (Figure 1, Item 1) until flywheel (Figure 1, Item 8) becomes unseated. If all three bolts become extremely tight, use a hammer to strike inside cupped area of pump adapter (Figure 1, Item 5) to help unseat flywheel.
 - g. Once flywheel (Figure 1, Item 8) is unseated, remove three bolts (Figure 1, Item 1), fender washers (Figure 1, Item 4), and pump adapter (Figure 1, Item 5) from flywheel.
 - h. Remove nut (Figure 1, Item 6) from crankshaft (Figure 1, Item 12). Start to pull flywheel (Figure 1, Item 8) off of crankshaft. Remove V-belt (Figure 1, Item 10) from pulley (Figure 1, Item 11) on flywheel and remove flywheel and key (Figure 1, Item 9) from crankshaft.
 - i. Install three fender washers (Figure 1, Item 4) over guide bushings on pump side of pump adapter (Figure 1, Item 5).
5. Remove three bolts (Figure 1, Item 13), lockwashers (Figure 1, Item 14), pulley (Figure 1, Item 11), and belt (Figure 1, Item 10). Discard lockwashers.



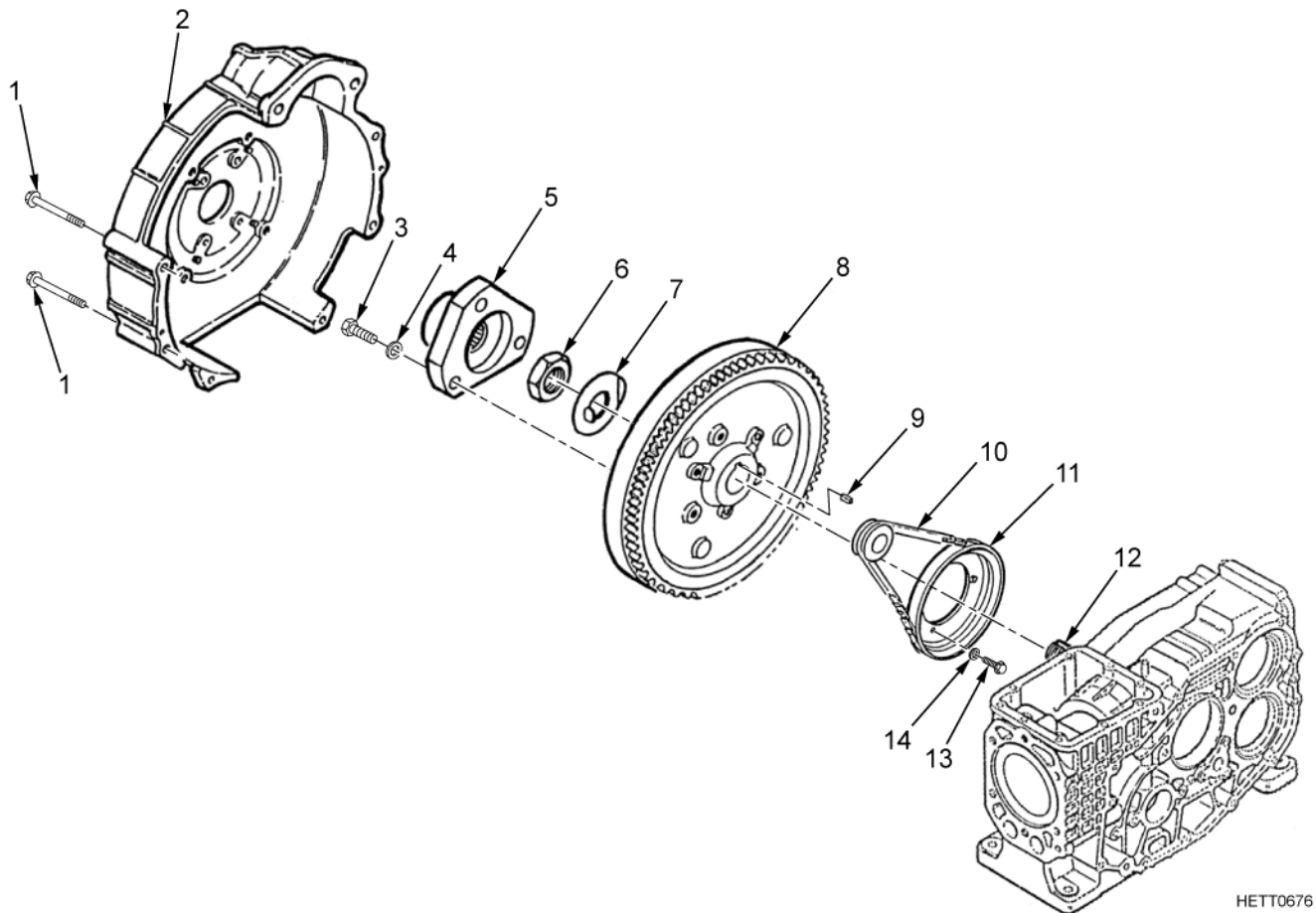
HETT0676

Figure 1. Flywheel Removal.

END OF TASK

INSTALLATION

1. Install pulley (Figure 2, Item 11) and flywheel (Figure 2, Item 8) on crankshaft (Figure 2, Item 12) and secure with three lockwashers (Figure 2, Item 14) and bolts (Figure 2, Item 13).
2. Install key (Figure 2, Item 9), flywheel (Figure 2, Item 8), and key washer (Figure 2, Item 7) on crankshaft (Figure 2, Item 12). Install belt (Figure 2, Item 10) over pulley (Figure 2, Item 11).
3. Apply thread locking compound to threads of nut (Figure 2, Item 6) and install.
4. Using a block of wood to prevent flywheel (Figure 2, Item 8) from turning and a torque wrench, torque nut (Figure 2, Item 6) to 101 to 116 lb-ft (137 to 157 Nm). Bend key washer (Figure 2, Item 7) to meet one face of nut (Figure 2, Item 6).
5. Install shaft coupling (Figure 2, Item 5) and secure with three fender washers (Figure 1, Item 4) and three bolts (Figure 2, Item 3).
6. Install flywheel housing (Figure 2, Item 2) and secure with six bolts (Figure 2, Item 1).



HETT0676

Figure 2. Flywheel Installation.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

INJECTION PUMP

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (WP 0168, Item 11)
 Crank, Hand APU (WP 0168, Item 18)
 Standard Army Tool Set (WP 0168, Item 28)

Shim
 Shim(s)

Personnel Required

2

Materials/Parts

Cap and Plug Set (WP 0170, Item 4)
 Oil, Lubricating (WP 0170, Item 20)
 Gasket
 Gasket

Equipment Conditions

Fuel tank drained (WP 0136).
 Auxiliary Power Unit (APU) removed (WP 0128).
 Air cleaner assembly removed (WP 0135).

GENERAL INFORMATION

This work package contains instructions for the removal and installation of the injection pump.

REMOVAL

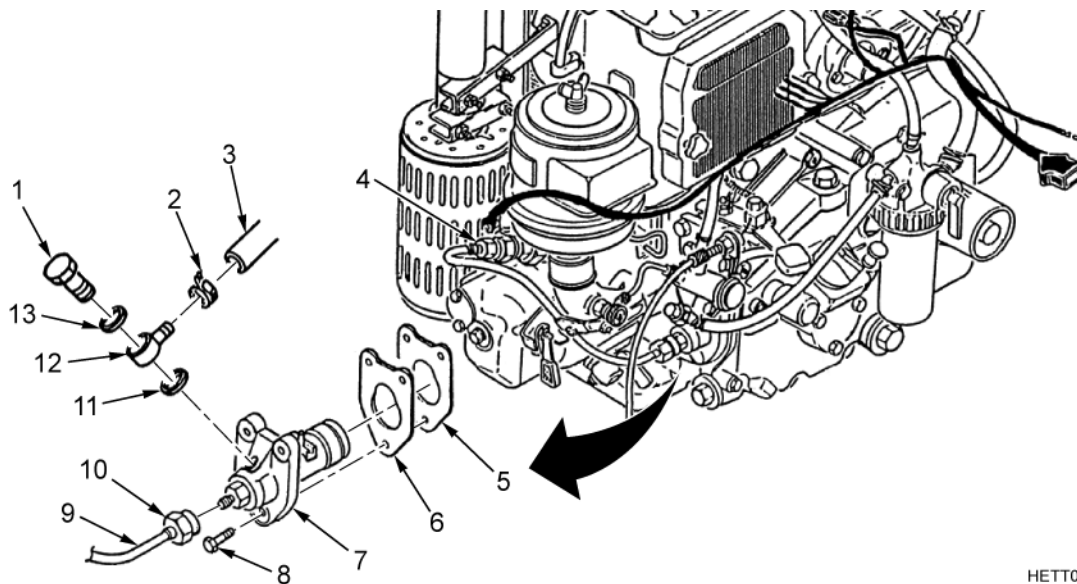
WARNING

Diesel fuel is combustible and is an irritant to the eyes, skin, and respiratory system. To avoid injury to personnel and explosion, extinguish all smoking materials and do not allow sparks or open flame near the fuel tank or the fuel system. Use skin and eye protection and work in a well-ventilated area. Clean up fuel that spilled during fuel line removal. Failure to follow this warning may result in injury to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent dirt, moisture, or other foreign material from entering the fuel system or damage to equipment may result.

1. Remove hose clamp (Figure 1, Item 2) and disconnect hose (Figure 1, Item 3). Cap/plug hose.
2. Remove bolt (Figure 1, Item 1), gasket (Figure 1, Item 13), adapter bushing (Figure 1, Item 12), and gasket (Figure 1, Item 11) from injection pump (Figure 1, Item 7). Discard gaskets.
3. Unscrew nut (Figure 1, Item 10) and disconnect metallic tube (Figure 1, Item 9) from injection pump (Figure 1, Item 7) and nozzle (Figure 1, Item 4). Cap/plug metallic tube.
4. Remove three bolts (Figure 1, Item 8), injection pump (Figure 1, Item 7), shim (Figure 1, Item 5), and shims (Figure 1, Item 6). Count and discard shims (Figure 1, Item 6). Discard shim (Figure 1, Item 5).



HETT0677

Figure 1. Injection Pump Removal.

END OF TASK

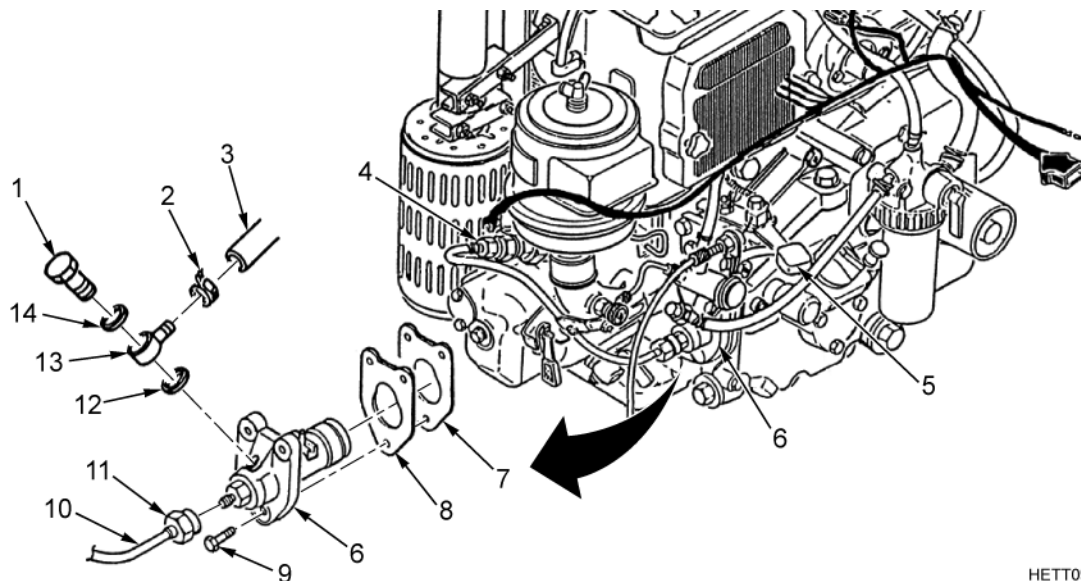
INSTALLATION

WARNING



Diesel fuel is combustible and is an irritant to the eyes, skin, and respiratory system. To avoid injury to personnel and explosion, extinguish all smoking materials and do not allow sparks or open flame near the fuel tank or the fuel system. Use skin and eye protection and work in a well-ventilated area. Clean up fuel that spilled during fuel line removal. Failure to follow this warning may result in injury to personnel.

1. Apply a thin coat of oil to both sides of new shims (Figure 2, Item 7).
2. Adjust cam lobe to lowest portion.
3. Install same quantity of new shims (Figure 2, Item 8) as removed and install new shim (Figure 2, Item 7).
4. Align fuel control rod and slot on speed control lever (Figure 2, Item 5) and install injection pump (Figure 2, Item 6) and three bolts (Figure 2, Item 9). Use torque wrench to torque bolts to 87 to 99 in.-lb (9.9 to 11.2 Nm).
5. Remove cap/plug and connect metallic tube (Figure 2, Item 10) to injection pump (Figure 2, Item 6) and nozzle (Figure 2, Item 4) and tighten nut (Figure 2, Item 11).
6. Install new gasket (Figure 2, Item 12), adapter bushing (Figure 2, Item 13), new gasket (Figure 2, Item 14), and bolt (Figure 2, Item 1) on injection pump (Figure 2, Item 6). Use torque wrench to torque bolt to 18 to 21 lb-ft (25 to 29 Nm).
7. Remove cap/plug and connect hose (Figure 2, Item 3) to injection pump (Figure 2, Item 6) and secure with hose clamp (Figure 2, Item 2).



HETT0945

Figure 2. Injection Pump Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Install APU (WP 0128).

Install air cleaner assembly (WP 0135).

Fill fuel tank with fuel (WP 0163).

END OF WORK PACKAGE

FIELD MAINTENANCE**CARGO TIEDOWN RING REPLACEMENT**

INITIAL SETUP:**Tools and Special Tools**

Welder Helmet (WP 0168, Item 16)
Apron, Leather (WP 0168, Item 17)
Angle Hand Grinder
Wire Brush
Primary Welding Machine MIG (GMAW): 18V-20V,
130A-150A and/or 18V-21V, 140A-160A
Alternate Stick Welding Machine (SMAW): 21V-25V,
110A-130A
Welding Rod Oven, 80°F to 125°F

Materials/Parts

Cleaner, Surface (WP 0170, Item 5)
Crocus Cloth, Abrasive (WP 0170, Item 6)
Coating Compound, Metal Pretreatment (WP 0170, Item 7)
Coating, Polyurethane (WP 0170, Item 8 or Item 9)

Materials/Parts-Cont.

Epoxy Primer Coating Kit (WP 0170, Item 12)
Welding Gas Mix: 75% Argon, 25% CO2
Welding Wire, ER80SD2, 0.035-in. Dia.
Welding Rod, E8018-B21, 1/8-in. Dia.
D-Ring, 1
D-Ring Retainer, 1

Personnel Required

1

References

ASW D1.1
MIL-STD-1595
TB 43-0242
MIL-STD-1261

GENERAL INFORMATION

This work package contains instructions for field replacement of broken cargo tiedown rings for M1000 semitrailers. This procedure is to be performed by certified welding personnel only per ASW D1.1, alternate MIL-STD-1595.

REPAIR OR REPLACEMENT

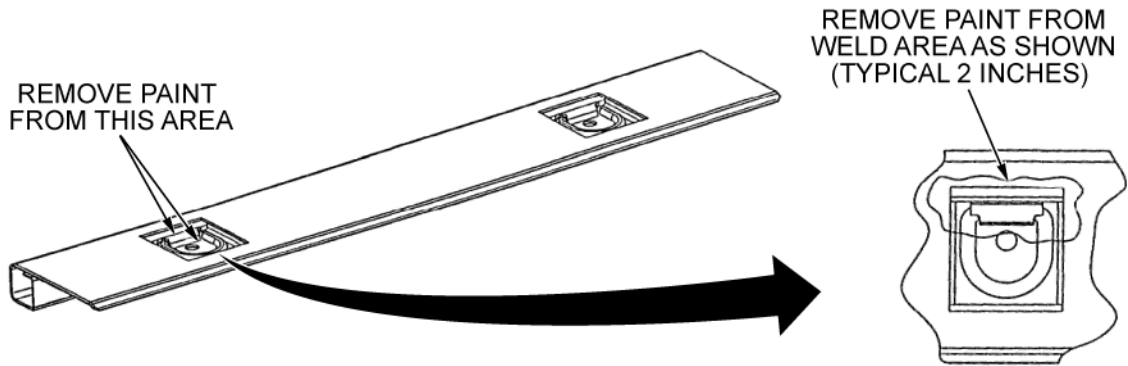
WARNING

Always use appropriate personal protective equipment (PPE). Failure to follow this warning may result in injury or death to personnel.

NOTE

The preferred method for removing paint is to use a wire brush. Chemical removal is an acceptable alternative based on facility regulations.

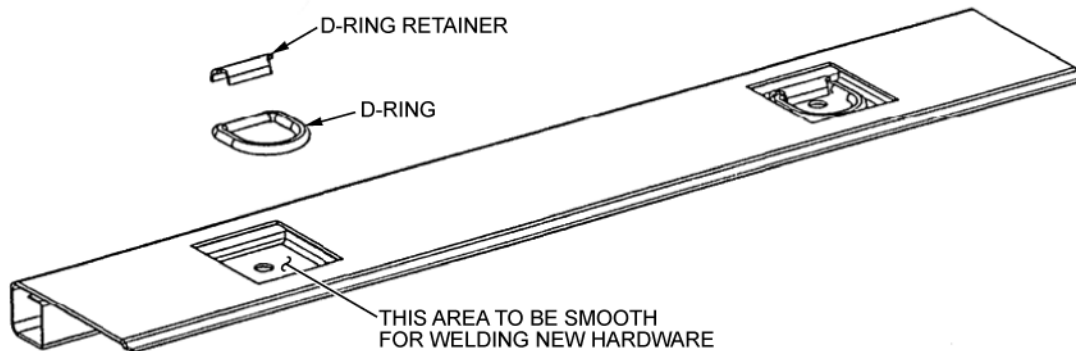
1. Remove paint from D-ring pocket 2 in. (5.08 cm) (Figure 1) diametrically from affected weld area using wire brush.



HETT0711

Figure 1. D-Ring Pocket.

2. Remove broken D-ring and D-ring retainer by grinding. Remove carbon deposits and grind or sand base metal to smooth flush surface (Figure 2). Weld or repair any gouges.



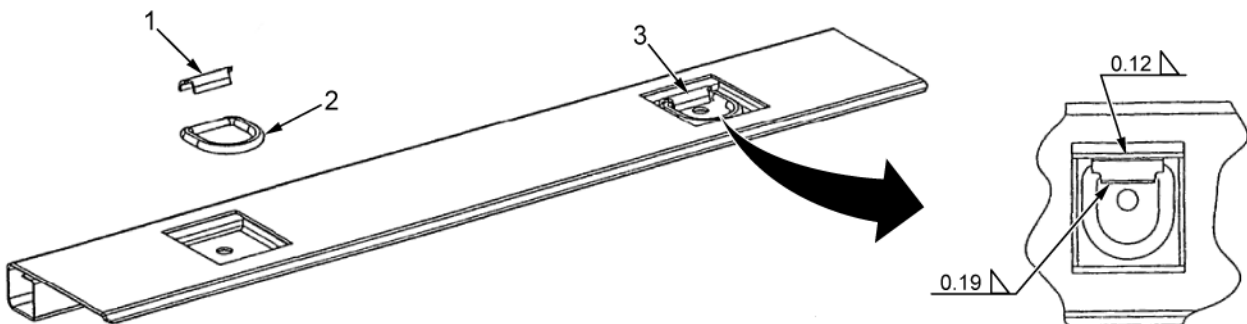
HETT0712

Figure 2. D-Ring Retainer and D-Ring Area to Be Smooth for Welding.

NOTE

Preheat temperature is 70°F (21°C) minimum. Inter-pass temperature is 300°F (149°C) maximum.

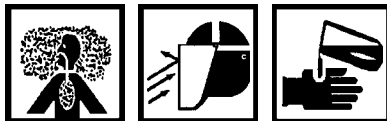
3. Locate D-ring (Figure 3, Item 2) and retainer (Figure 3, Item 1) and weld (Figure 3, Item 3) in place using following settings:
 - a. Primary short arc welder settings (GMAW):
 - (1) Welding wire type:
 - (a) ER80SD2, 0.035-in. diameter
 - (b) 18V-21V, 130A-160A, 1 pass
 - (c) Gas mix: 75% Argon, 25% CO₂
 - (d) Positions: flat/horizontal/vertical/overhead
 - b. Alternate stick welder settings (SMAW):
 - (1) Welding rod type:
 - (a) E8018-B2L, 1/8-in. diameter
 - (b) 21V-25V, 110A-130A, 1 pass
 - (c) Positions: horizontal/vertical



HETT0817

Figure 3. Welding D-Ring and D-Ring Retainer.

END OF TASK

CLEANING**WARNING**

Check facility regulations for paint removal processes. Always use appropriate personal protective equipment (PPE). Failure to follow this warning may result in injury or death to personnel.

1. Prior to painting, visually inspect welds per (MIL-STD-1261) to ensure that there are no cracks.
2. Clean area thoroughly, removing all weld slag and spatter.
3. Feather edges of paint using clean wiping rag.

NOTE

Acetate-based products or enamel reducers are preferable. Check local regulations.

4. Hand-wipe area using solvent and clean wiping rag.
5. Touch up paint per TB 43-0242.

WARNING

Cleaning compound may cause skin rash and may give off harmful vapors. To avoid injury to personnel, use in well ventilated area. Wash immediately with soap and water if compound contacts skin or clothes. Failure to follow this warning may result in injury or death to personnel.

6. Use brush or sponge and pretreat area using coating compound or surface cleaner. Apply thin coat (no puddles). Allow 30 minutes drying time.
7. Use a brush or spray application and prime area using epoxy primer. Desired dry film thickness is 0.039 to 0.059 in. (1 to 1.5 mm). Allow 2 to 4 hours drying time.
8. Use brush or spray application and topcoat using polyurethane coating. Specify color by pattern:
 - a. Black, color chip no. 37030
 - b. Brown, color chip no. 30051
 - c. Green, color chip no. 34094
9. Desired dry film thickness is 0.070 to 0.126 in. (1.8 to 3.2 mm). Allow 3 to 4 hours drying time.

END OF TASK

DISPOSITION OF PARTS

Locally dispose of all removed parts.

INSPECTION REQUIREMENTS

Visually inspect for cracks and quality of welds.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**LUBRICATION INSTRUCTIONS AND CHARTS**

INITIAL SETUP:

Materials/Parts	TB 43-0211
Grease (GAA) (WP 0170, Item 12)	(WP 0004)
Hydraulic Fluid (WP 0170, Item 13)	(WP 0011)
Solid Film lubricant (WP 0170, Item 14)	(WP 0012)
Pipe Sealant (WP 0170, Item 18)	(WP 0140)
Wiping Rags (WP 0170, Item 19)	(WP 0151)
Dry Cleaning Solvent (WP 0170, Item 26)	(WP 0170)

ReferencesDA PAM 738-750

GENERAL INFORMATION

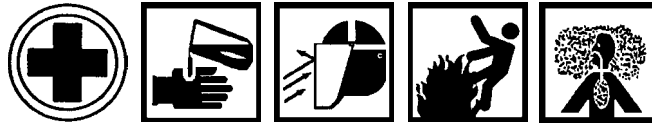
This chapter includes a lubrication chart and instructions to be followed by the operator/crew personnel. Troubleshooting procedures and those maintenance tasks that can be performed by the operator/crew are also included.

LUBRICATION INSTRUCTIONS

1. Lubrication instructions are mandatory. The field maintenance officer can authorize the operator to assist in certain maintenance functions. If a lubrication fitting will not accept grease, check fitting to ensure it is properly tightened. Tighten fitting if loose. If fitting still will not accept grease, notify the supervisor.
2. Service intervals are based on normal operation.
 - a. Lubricate more often during constant use.
 - b. Lubricate less often during inactive periods.
 - c. Lubricate twice as often in extreme dust and sand conditions.
3. Lubricate after high-pressure washing, fording, or steam cleaning.
4. Clean grease fitting before lubricating.
5. Lubricate both sides of equipment.
6. DO NOT over lubricate.
7. Wipe off excess lubricant.
8. Maintain a record of all lubrication tasks performed.
9. Report any problems noted during lubrication.
10. Refer to DA PAM 738-750 for maintenance forms and procedures to record and report any findings.

LUBRICATION CHART

The lubrication chart provides instructions for lubrication procedures, use of proper materials for lubricating, and recommended time between lubrication. Intervals are based on normal operation (ON-condition or hard time). Change the hard time interval if you are operating the equipment under adverse operating conditions including longer-than-usual operating hours. The hard time interval may be extended during periods of low activity. If extended, adequate preservation precautions must be taken. Location of fittings and other points to be serviced are included.

WARNING**SOLVENT CLEANING COMPOUND (DRY CLEANING SOLVENT)**

- Solvent cleaning compound MIL-PRF-680 Type II and Type III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion may cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage, and may be fatal if swallowed. Inhalation of high/massive concentrations may cause coma or may be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition.
- The flashpoint for Type II solvent cleaning compound is 141 to 198°F (61 to 92°C) and for Type III it is 200 to 241°F (93 to 116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.
- Fire extinguishers should be placed nearby when using solvent cleaning compound.
- Cloths or rags saturated with solvent cleaning compound must be disposed of in accordance with authorized facilities' procedures.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.
- Compressed air used for cleaning/drying may create airborne particles that may injure the eyes. Always wear eye protection. Pressure must not exceed 30 psi (207 kPa) or injury to personnel may result.

Failure to follow these warnings may result in injury or death to personnel.

WARNING

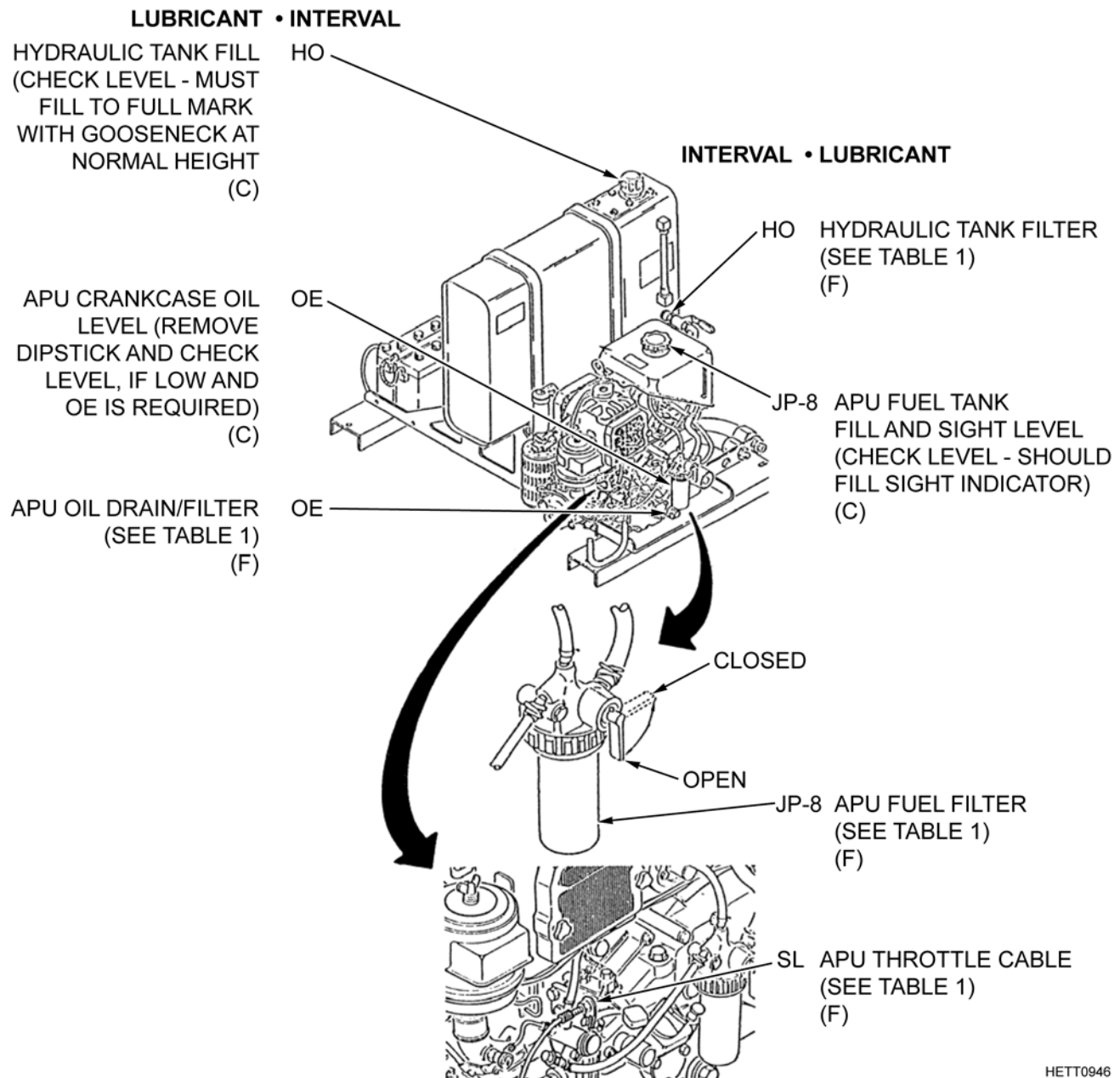
- Before performing lubrication procedures (WP 0140) on semitrailer, raise platform to highest position, lower front (WP 0011) and rear support legs (WP 0012), and close all isolation valves (WP 0004).
- On some semitrailers, a solar battery charger is mounted to top of gooseneck directly in front of spare tires. Persons working on top of gooseneck must take **EXTREME** care not to step on the gooseneck or trip over it. Failure to follow this warning may result in Injury to personnel or damage to equipment.

CAUTION

- When adding fluid to hydraulic tank, use **ONLY** hydraulic oil, MIL-H-46170, Type I (WP 0170, Item 13). Using any other fluid may cause damage to APU.
- When refueling APU, add the diesel fuel in the fuel tank, **NOT** the hydraulic tank. Failure to follow this caution may result in damage to the auxiliary power unit (APU).

NOTE

- Clean fittings before lubricating. Clean parts with dry cleaning solvent (WP 0170, Item 26). Dry fittings before lubricating.
- The lowest level of maintenance authorized to lubricate a point is indicated by one of the following symbols as appropriate: Operator/Crew (C) and Field Maintenance (F).
- Where "Daily" services are specified, daily shall be interpreted to mean only on days when equipment is operated.



HETT0946

Figure 1. Lubricant - Interval No. 1.

Table 1. Lubricant Chart No. 1.

LUBRICANTS		RECOMMEND KEY		CAPACITY	EXPECTED TEMPERATURES			INTERVALS
					ABOVE +32°F	+ 40°F TO - 10°F	0°F TO -50°F	
OE (MIL-L-2104B)	OIL, ENGINE APU CRANK- CASE	APU Crankcase Oil Level (Remove dipstick and check level; if low add OE as required)	C	1.37 qt. (1.3 L)	SAE 30	SAE 20	10W-30	D - Daily S - Semi- annually
		APU Oil Drain/Filter (See step 1 below)	F					
HO (MIL-H-46170, Type I)	HY- DRAULIC OIL, PETRO- LEUM BASED Hydraulic Tank	Hydraulic Tank Fill (Check level - must fill to FULL mark with gooseneck at normal height)	C	16.5 gal (62.5 L)	ALL TEMPERATURES			D - Daily A - Annually
		Hydraulic Tank Filter (See step 2 below)	F					
JP-8 (MIL-DTL-83133)	TURBINE FUEL Fuel Tank	APU Fuel Tank Fill and Sight Level (Check level - should fill sight Indicator)	C	1.27 gal (4.8 L)	ALL TEMPERATURES			D - Daily S - Semi- annually
		APU Fuel Filter (See step 3 below)	F					
SL (NSN 6850-01-139-4040)	SILICONE LUBRIC- ANT APU Throttle Control	APU Throttle Cable (See step 4 below)	F	As req.	ALL TEMPERATURES			S - Semi- annually

APU CRANKCASE

1. Change oil and clean filter semiannually. Replace filter if damaged. Remove drain plug and oil filter elements. Clean filter using cleaning solvent (WP 0170, Item 26). Lube filter and new gasket with oil (OE), and install gasket with drain plug. Remove oil filter cap and add 1.37 qt (1.3 l) of oil (OE). Check oil level on dipstick.

HYDRAULIC TANK

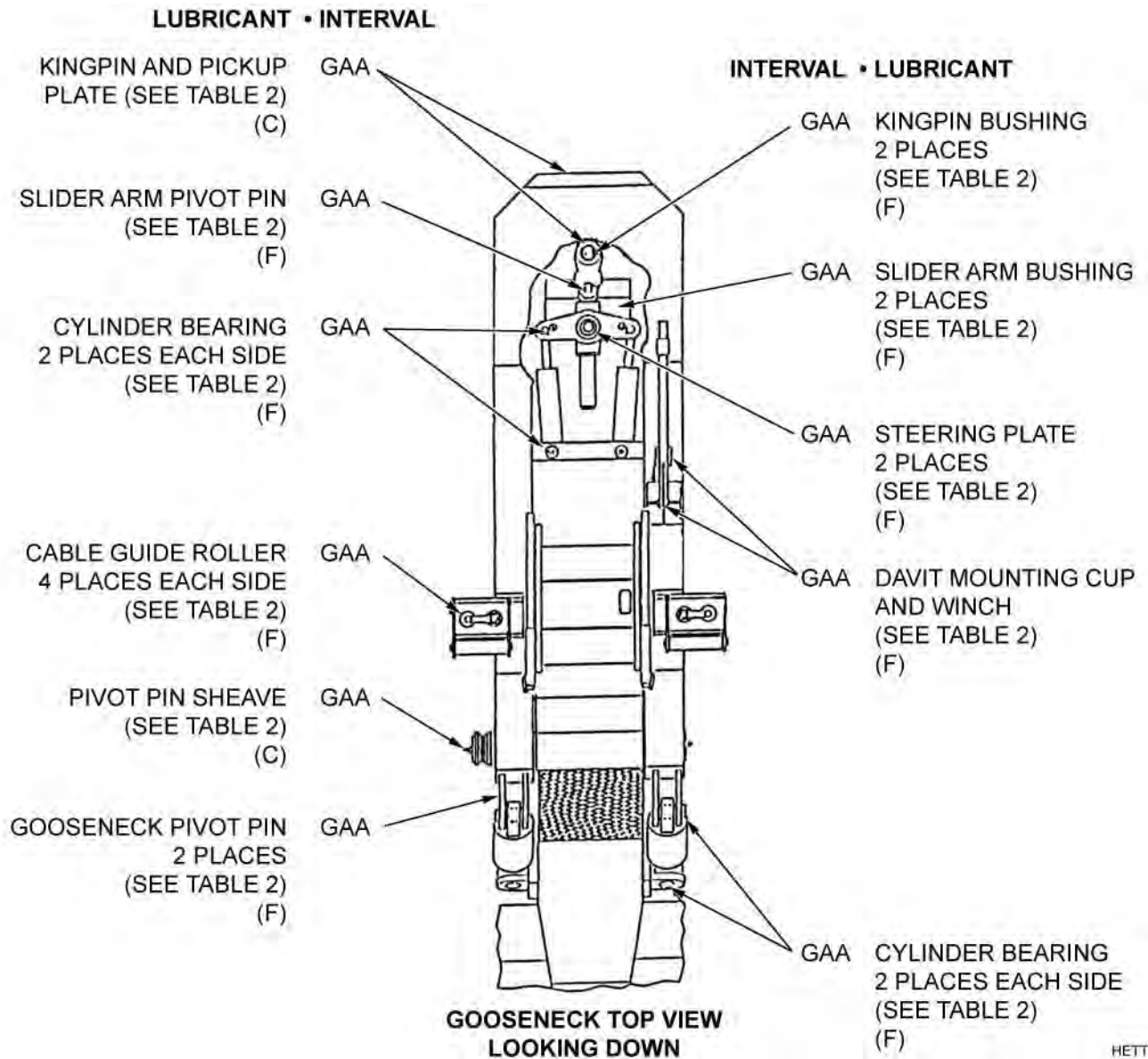
- 2a. M1000 Semitrailer is controlled in Army Oil Analysis Program (AOAP) for hydraulic oil sampling. Active Army units, Reserve units, and National Guard activities will send an oil sample to AOAP laboratory for analysis every 365 days (annually). An AOAP laboratory may change this interval for sampling, as well as draining and refilling hydraulic oil. Refer to TB 43-0211 for additional AOAP information.
- 2b. To gain access to hydraulic oil, place gooseneck in normal operating position (either coupled or level). Locate pipe plug on front of hydraulic tank and visually check sight gauge on rear of tank to confirm that oil level is below pipe plug. If it appears that oil level is too high in tank to remove plug without spilling hydraulic oil, lower level of oil in tank by raising platform approximately 1 in. (2.5 cm). This will cause hydraulic oil to move out of tank and into system lowering level of oil in tank. Remove pipe plug located on front of hydraulic tank and insert sampling tube to pull oil sample. When reinstalling pipe plug, apply pipe sealant (WP 0170, Item 18) to all threads of plug.
- 2c. If AOAP laboratory support is not available, drain and refill hydraulic tank and clean filter annually. Replace filter if damaged. To drain oil, close oil tank valve and remove drain plug from hydraulic tank. Check (magnetic) drain plug for metal particles and if particles are found, wipe clean with clean rag. Remove tank inlet, attaching hardware, gasket, and hydraulic tank filter. Clean filter using cleaning solvent (WP 0170, Item 26). Lube filter and new gasket with clean oil (HO). Install filter, gasket, tank inlet, and attaching hardware. Refill using hydraulic fluid (HO) as required and open oil tank valve.

FUEL FILTER

3. Remove and replace fuel filter semiannually. To remove, turn fuel petcock to closed position. Unscrew fuel filter housing ring and remove glass bowl and fuel filter. To replace filter, put filter on filter block, fill glass bowl half with diesel fuel (DF) as required, and install on filter block. Secure glass bowl to block by installing filter housing ring. Turn fuel petcock to open position to vent.

THROTTLE CABLE

4. Clean throttle cable and re-lubricate semiannually. Remove wire end from APU manual control and clean any dirt or oil buildup from cable using rags. Spray end of cable and into cable housing with silicone lubricant and direct spray into cable housing and allow fluid to run down into housing. Operate throttle control several times to ensure cable operates freely. Reconnect wire end of throttle control back to APU manual control.



HETT0948

Figure 2. Lubrication - Interval No. 2.

Table 2. Lubricant Chart No. 2.

LUBRICANTS					EXPECTED TEMPERATURES			
GAA (MIL-G-10924)	GREASE, AUTO- MOTIVE AND ARTILLERY	RECOMMENDED KEY		Capacity	ABOVE +32°F	+40°F to -10° F	0°F to -50°F	Intervals
GAA (MIL-G-10924)	Kingpin and Pickup Plate	Kingpin and Pickup Plate (See Step 5 below)	C	As req	ALL TEMPERATURES			D - Daily
GAA (MIL-G-10924)	Slider Arm Pivot Pin	Slider Arm Pivot Pin (See Step 6 below)	F	As req				M - Monthly
GAA (MIL-G-10924)	Cylinder Bearing	Cylinder Bearing - 2 placed each side (See step 6 below)	F	As req				M - Monthly
GAA (MIL-G-10924)	Step Assembly Hinge			As req				
GAA (MIL-G-10924)	Cable Guide Roller	Cable Guide Rollers - 4 places each side (See step 8 below)	F	As req	ALL TEMPERATURES			Q - Quarterly
GAA (MIL-G-10924)	Pivot Pin Sheave	Pivot Pin Sheave (see step 6 below)	C	As req				M - Monthly
GAA (MIL-G-10924)	Gooseneck Pivot Pin	Gooseneck Pivot Pin - 2 places (See step 6 below)	F	As req				M - Monthly
GAA (MIL-G-10924)	Kingpin Bushing	Kingpin Bushing - 2 places (See step 6 below)	F	As req				M - Monthly
GAA (MIL-G-10924)	Slider Arm Bushing	Slider Arm Bushing - 2 places (See step 6 below)	F	As req				M - Monthly
GAA (MIL-G-10924)	Steering Plate	Steering Plate - 2 places (See step 6 below)	F	As req				M - Monthly
GAA (MIL-G-10924)	Davit Cup and Winch	Davit Mounting Cup and Winch (See step 7 below)	F	As req				M - Monthly
GAA (MIL-G-10924)	Cylinder Bearing	Cylinder Bearing - 2 places each side (See step 6 below)	F	As req				

KINGPIN AND PICKUP PLATE

5. Daily, before coupling semitrailer, check for grease on kingpin and pickup plate. Scrape off any existing grease that may have built up. Clean surfaces using rags. Hand-apply generous portions of grease (GAA) (WP 0170, Item 12) to contact surfaces as required.

GOOSENECK GREASE FITTINGS AND PIVOT PIN SHEAVE

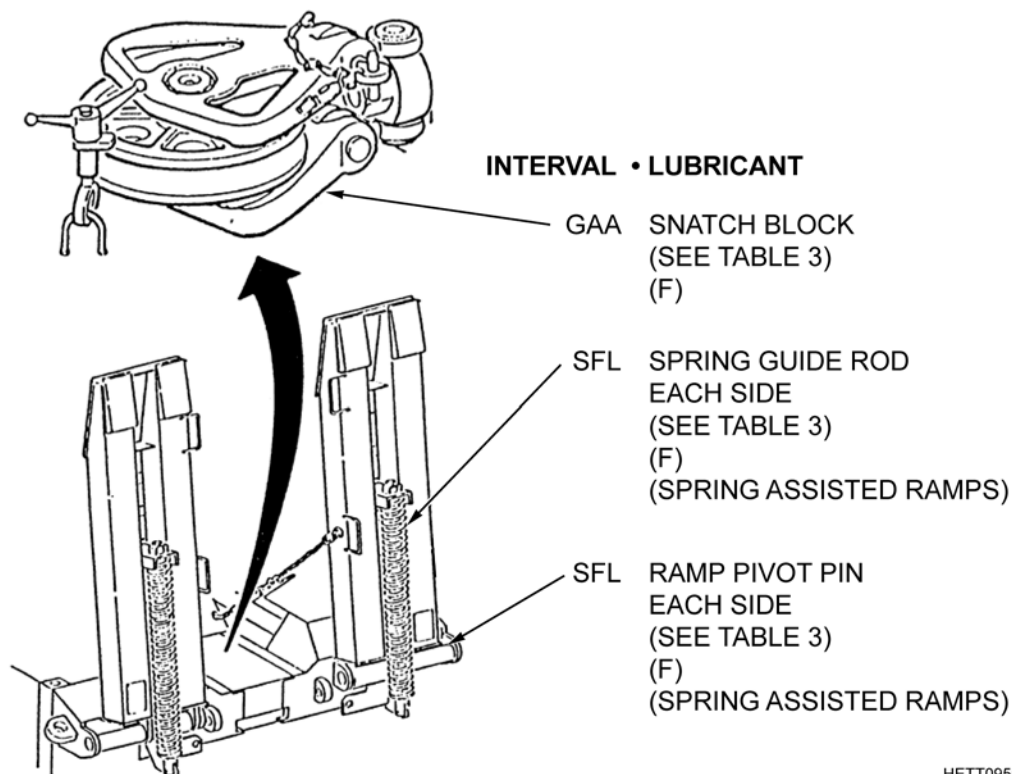
6. Lubricate gooseneck grease fittings and pivot pin sheave fitting monthly. Clean surrounding areas and all fittings. DO NOT OVERFILL. Add grease (GAA) (WP 0170, Item 12) to fittings as required. Wipe off excess grease with rag.

DAVIT MOUNTING CUP, WINCH, AND STEP HINGE

7. Lubricate davit mounting cup, winch, and step hinges monthly. Scrape off any existing grease that may have built up. Clean surfaces using rags. Hand-apply generous portions of grease (GAA) (WP 0170, Item 12) to the davit, mounting cup, winch gears, and step hinges. Wipe off excess grease with rag.

CABLE GUIDES

8. Lubricate cable guide grease fittings quarterly. Clean surrounding areas and all fittings. DO NOT OVERFILL. Add grease (GAA) (WP 0170, Item 12) to fittings as required. Wipe off excess grease with rag.



HETT0950

Figure 3. Lubricant - Interval No. 3.

Table 3. Lubricant Chart No. 3.

LUBRICANTS		RECOMMENDED KEY		CA-PAC-ITY	EXPECTED TEMPERATURES			INTER-VALS
					ABOVE +32° F	+40°F to -10°F	0°F to -50°F	
GAA (MIL-G-10924)	GREASE, AUTO-MOTIVE ARTILLERY				ALL TEMPERATURES			M - Monthly
	Snatch Block	Snatch Block (See step 9 below)	F	As req				M - Monthly
	Cylinder Bearing	(See Table Chart #2)		As req	ALL TEMPERATURES			
SFL SW26723 (MIL-L-23398) (NSN 9150-01-260-2534)	SOLID FILM LUBRICANT Spring Guide Rod	Spring Guide Rod - each side (See step 10 below) (Spring assisted ramps)	F	As req				M - Monthly
	Ramp Pivot Pin	Ramp Pivot Pin - each side (See step 11 below) (Spring assisted ramps)	F	As req				M - Monthly

SNATCH BLOCK

9. Lubricate snatch block monthly. Scrape off any existing grease and dirt that may have built up. Clean surfaces using rags. Clean surrounding areas and fittings. DO NOT OVERFILL. Lubricate sheave pin at grease fitting on bottom side of snatch block. Hand-apply generous portions of grease (GAA) (WP 0170, Item 12) to all moving parts on the snatch block and contact areas. Wipe off excess grease with rag.

SPRING GUIDE ROD

10. Lubricate ramp spring guide rods monthly. If necessary, remove guide rod and spring assembly from ramp to scrape off any existing grease and dirt that has built up. Clean surfaces using rags. Spray generous portions of solid film lubricant (SFL) (WP 0170, Item 14) on spring rod and rod contact surfaces. Wipe off excess lubricant with rag.

RAMP PIVOT PIN

11. Lubricate ramp pivot pins monthly. Scrape off any existing grease and dirt that may have built up and clean surfaces and surrounding areas using rags. Spray generous portions of solid film lubricant (SFL) (WP 0170, Item 14) to ramp pivot pin surfaces. Wipe off excess lubricant with rag.

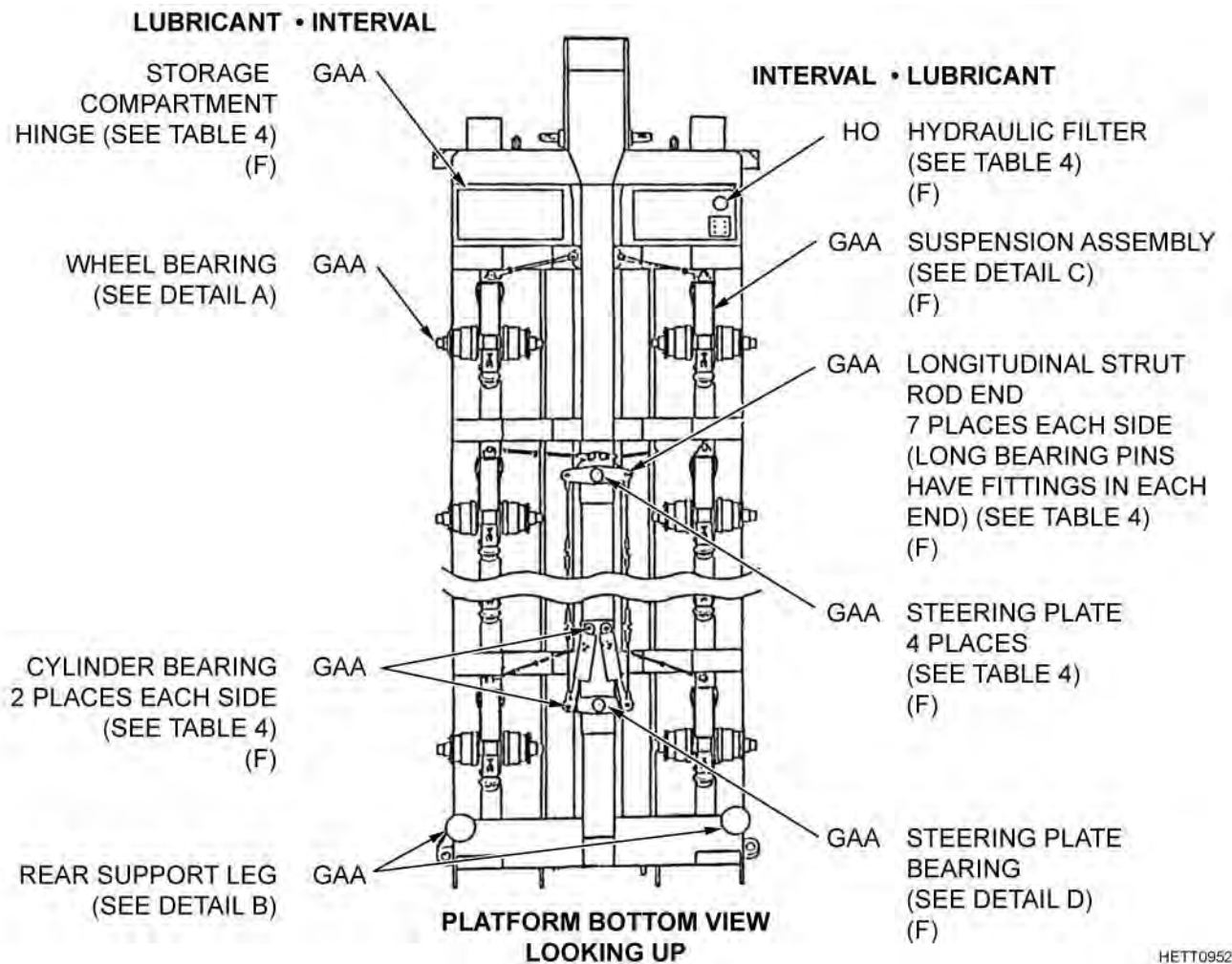


Figure 4. Lubricant - Interval No. 4.

Table 4. Lubricant Chart No. 4.

					EXPECTED TEMPERATURES			
LUBRICANTS		RECOMMENDED KEY		CAPACITY	ABOVE +32°F	+40°F to -10°F	0°F to -50°F	INTERVALS
GAA (MIL-G-10924)	GREASE, AUTO-MOTIVE AND ARTILLERY				ALL TEMPERATURES			
GAA (MIL-G-10924)	Storage Compartment Hinge	Storage Compartment Hinge (See step 12 below)	F	As req				S - Semi-annually
GAA (MIL-G-10924)	Fixed Steering Arm Rod End			As req				
GAA (MIL-G-10924)	Wheel Bearing	Wheel Bearing (See Item Detail A)		As req				A - Annually
GAA (MIL-G-10924)	Cylinder Bearing	Cylinder Bearing - 2 places each side (See step 13)	F	As req				M - Monthly
GAA (MIL-G-10924)	Rear Support Leg	Rear Support Leg (See Item Detail B)		As req	ALL TEMPERATURES			M - Monthly
GAA (MIL-G-10924)	Suspension Assembly	Suspension Assembly (24) (See Item Detail C)	F	As req				M - Monthly
GAA (MIL-G-10924)	Longitudinal Strut Rod End	Longitudinal Strut Rod End - 7 places each side (Long bearing pins have fittings in each end) (See step 13 below)	F	As req				M - Monthly
GAA (MIL-G-10924)	Steering Plate	Steering Plate - 4 places (See step 13 below)	F	As req				M - Monthly
GAA (MIL-G-10924)	Steering Plate Bearing	Steering Plate Bearing (See Item Detail D)	F	As req				
HO (MIL-H-46170)	HYDRAULIC OIL, PETROLEUM BASED Hydraulic Filter	Hydraulic Filter (See step 14)	F	As req				A - Annually

STORAGE COMPARTMENT HINGE

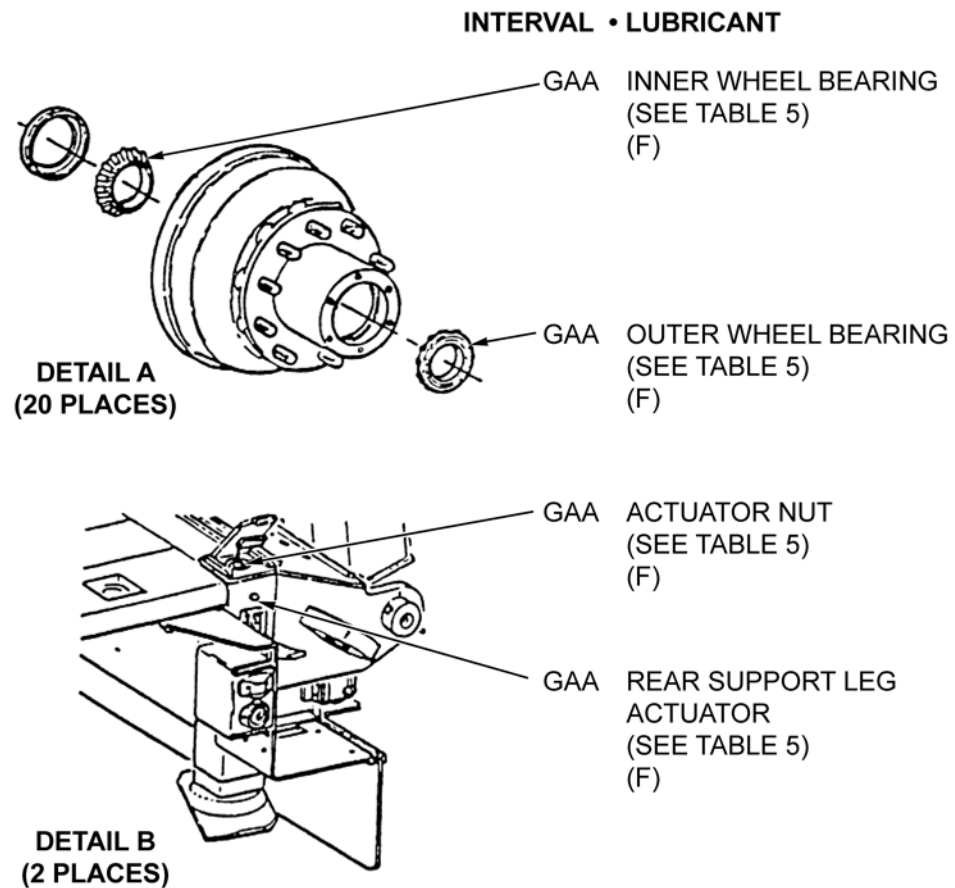
12. Lubricate storage compartment hinge semiannually. Scrape off any existing grease that may have built up. Clean surfaces using rags. Hand-apply generous portions of grease (GAA) (WP 0170, Item 12) to storage compartment hinge surface area. Wipe off excess grease with rag.

PLATFORM GREASE FITTINGS

13. Lubricate platform grease fittings monthly. Clean surrounding areas and all fittings. Add grease (GAA) (WP 0170, Item 12) to fittings as required. Wipe off excess grease with rag. DO NOT OVERFILL.

HYDRAULIC FILTER

14. Remove and replace hydraulic filter annually. To drain, close ball valve at hydraulic tank. Unscrew and remove filter housing, gasket, and filter. Clean filter housing using clean fluid (HO). To fill, replace filter and gasket to filter block. Thread filter housing to filter block.



HETT0954

Figure 5. Lubricant - Interval No. 5.

Table 6. Lubricant Chart No. 5.

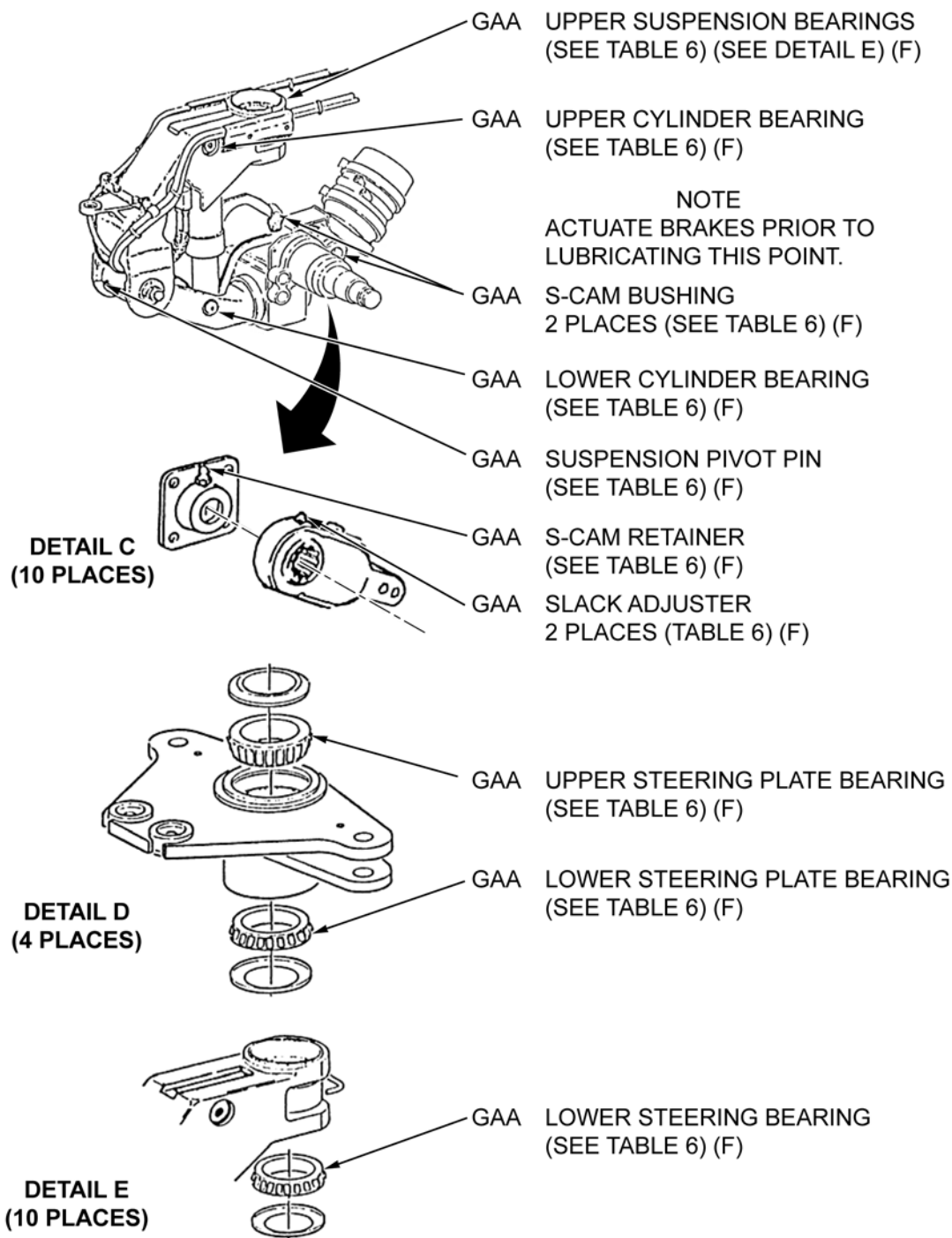
LUBRICANTS		RECOMMENDED KEY		CAPACITY	EXPECTED TEMPERATURES			INTERVALS
					ABOVE +32°F	+40°F to -10°F	0°F to -50°F	
GAA (MIL-G-10924)	GREASE, AUTO-MOTIVE ARTILLERY				ALL TEMPERATURES			
GAA (MIL-G-10924)	Inner Wheel Bearing	Inner Wheel Bearing (See step 15)	F	As req				A - Annually
GAA (MIL-G-10924)	Outer wheel Bearing	Outer Wheel Bearing (See step 15)	F	As req	ALL TEMPERATURES			A - Annually
GAA (MIL-G-10924)	Actuator Nut	Actuator Nut (See step 16)	F	As req				M - Monthly
GAA (MIL-G-10924)	Rear Support Leg Actuator	Rear Support Leg Actuator (See step 16)	F	As req				M - Monthly

INNER AND OUTER WHEEL BEARINGS

15. Remove, clean, and hand or pressure-pack inner and outer wheel bearings annually. Clean any existing grease from bearings and hub and drum assembly. Clean surfaces using rags. Hand-pack or pressure-pack inner and outer wheel bearings with grease (GAA) (WP 0170, Item 12). Wipe off excess grease with rag.

ACTUATOR NUT AND REAR SUPPORT LEG ACTUATOR

16. Lubricate actuator nut and rear support leg actuator monthly. Clean surrounding areas and all fittings. Add grease to fittings as required. Wipe off excess grease with rag. DO NOT OVERFILL.

INTERVAL • LUBRICANT

HETT0956

Figure 6. Lubricant - Interval No. 6.

Table 7. Lubrication Chart No. 6.

					EXPECTED TEMPERATURES			
LUBRICANTS		RECOMMENDED KEY		CAPACITY	ABOVE +32°F	+40°F to -10°F	0°F to -50°F	INTERVALS
GAA (MIL-G-10924)	GREASE, AUTO-MOTIVE AND ARTILLERY				ALL TEMPERATURES			
GAA (MIL-G-10924)	Upper Suspension Bearing	Upper Suspension Bearings (See step 17) (See Item Detail E)	F	As req				M - Monthly
GAA (MIL-G-10924)	Upper Cylinder Bearing	Upper Cylinder Bearing (See note 17)	F	As req				M - Monthly
		NOTE Actuate Brakes prior to lubricating this point.						
GAA (MIL-G-10924)	S-Cam Retainer	S-Cam Retainer (See step 17)	F	As req				M - Monthly
GAA (MIL-G-10924)	Suspension Pivot Pin	Suspension Pivot Pin (See step 17)	F	As req				M - Monthly
GAA (MIL-G-10924)	Lower Cylinder Bearing	Lower Cylinder Bearing (See step 17)	F	As req	ALL TEMPERATURES			M - Monthly
GAA (MIL-G-10924)	S-Cam Bushing	S-Cam Bushing - 2 places (See step 17)	F	As req				M - Monthly
GAA (MIL-G-10924)	Slack Adjuster	Slack Adjuster - 2 places (41) (See step 17)	F	As req				M - Monthly
GAA (MIL-G-10924)	Upper Steering Plate Bearing	Upper Steering Plate Bearing (See step 18)	F	As req				Y - 5 Years
GAA (MIL-G-10924)	Lower Steering Plate Bearing	Lower Steering Plate Bearing (See step 18)	F	As req				Y - 5 Years
GAA (MIL-G-10924)	Lower Suspension Bearing	Lower Suspension Bearing (See step 19)	F	As req				Y - 5 Years

WARNING

Excess grease must be wiped clean when lubricating S-Cam bushings. Failure to do so may cause brake malfunctions and injury to personnel.

UPPER SUSPENSION BEARINGS AND UPPER AND LOWER CYLINDER BEARINGS, S-CAM RETAINER, S-CAM BUSHING, SLACK ADJUSTER, AND SUSPENSION PIVOT PINS

17. Lubricate upper suspension bearings and upper and lower cylinder bearings, S-Cam retainers, S-Cam bushings (plug nearest axle on each brake dust shield must be removed to access S-Cam bushing fitting), slack adjuster, and suspension pivot pins monthly. Clean surrounding areas and all fittings. Apply grease (GAA) (WP 0170, Item 12) to upper suspension assembly and upper and lower cylinder bearings, brake, camshafts, and suspension pivot pin fittings as required. Wipe off excess grease with rag. **DO NOT OVERFILL.** The suspension pivot pin has two fittings which service the same piece. If fully serviced through one fitting, the other fitting will appear to not take grease. Deck must be in lowest position to lubricate brake camshaft and S-Cam retainer.

UPPER AND LOWER STEERING PLATE BEARINGS

18. Remove, clean, and hand-pack or pressure-pack upper and lower steering plate bearings every 5 years. Clean any existing grease from bearings and steering plates. Hand-pack or pressure-pack bearings with grease (GAA) (WP 0170, Item 12). Wipe off excess grease with rag.

LOWER SUSPENSION BEARING

19. Every 5 years remove, clean, and hand-pack or pressure-pack lower suspension bearing. Clean any existing grease from bearing and upper suspension arm. Hand-pack or pressure-pack bearings with grease (GAA) (WP 0170, Item 12). Wipe off excess grease with rag.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

ILLUSTRATED LIST OF MANUFACTURED ITEMS

INTRODUCTION

Scope

This work package includes complete instructions for making items authorized to be manufactured or fabricated at the field level of maintenance.

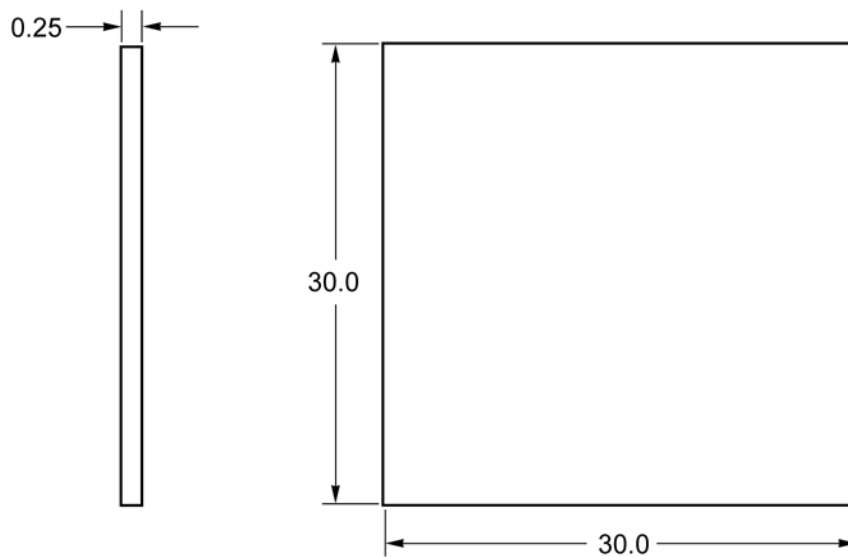
How to Use the Index of Manufactured Items

A part number index in alphanumeric order is provided for cross-referencing the part number of the item to be manufactured to the information that covers fabrication criteria.

Explanation of the Illustrations of Manufactured Items

All instructions needed by maintenance personnel to manufacture the item are included on the illustrations. (When applicable, a reference to the associated parts information TM or parts information work package shall be entered here). All bulk materials needed for manufacture of an item are listed by part number or specification number in a tabular list on the illustration.

<u>DRAWING/ PART NO.</u>	<u>NOMENCLATURE</u>	<u>FIGURE NO.</u>
-	Base Plate	F-1
-	Base Tube	F-2
SW34329	Battery Terminal Cover	F-3
T4249	Bearing Seating Tool	F-4
SW34348-3	Bushing Puller	F-5
SW32540	Crowbar	F-6
SW32910	Double Loop Clamp	F-7
SW34434	Flushing Hose Kit	F-8
SW34353-2	Fuel Gauge Tube	F-9
-	Gooseneck Support Stand	F-10
-	Gusset	F-11
-	Gusset	F-12
-	Handle	F-13
SW34435	Hydraulic Control Module Removal/Installation	F-14
	Chain Set	
SW34436	Removal Tool (Suspension Cylinder Pin)	F-15
-	Retainer Pin	F-16
-	Support Tube	F-17
SW34348-7	Threaded Rod	F-18
SW34348	Urethane Bushing Removal/Installation Tool	F-19
SW34348-5	Washer	F-20
-	Wire Assembly	F-21
-	Hexagon Stock, 1/2 in.	F-22



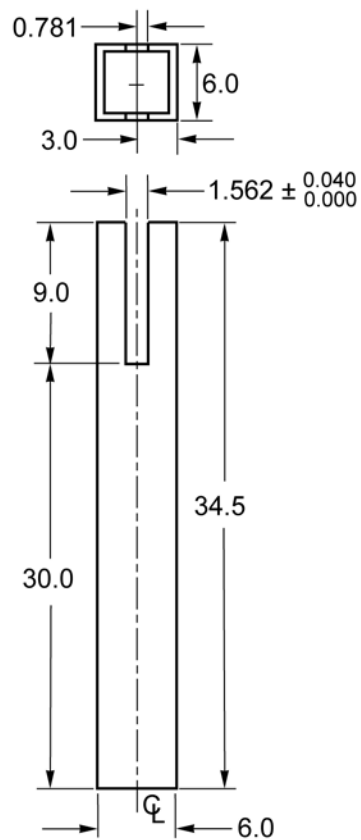
HETT0688

FIGURE F-1. BASE PLATE**NOTE**

1. All Dimensions Are in Inches.
2. Dimensions Without Tolerances Are Not Considered Critical.
3. Remove All Burrs and Sharp Edges.
4. Fabricate From: Steel Plate, C-1045 (0.250) in. Thick.

BULK MATERIAL

Steel Plate (0.250) in. thick, 30X30 C-1045 0164164



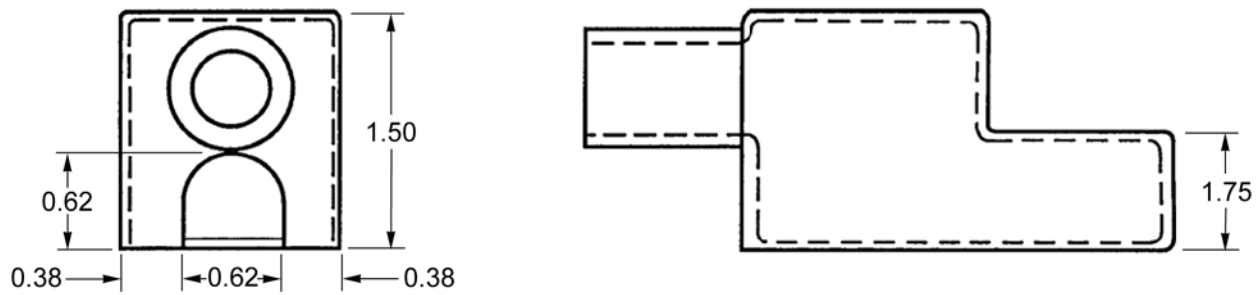
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FIGURE F-2. BASE TUBE**NOTE**

1. All Dimensions Are in Inches Except as Noted.
2. Dimensions Without Tolerances Are Not Considered Critical.
3. Remove All Burrs and Sharp Edges.
4. Fabricate From: Steel Tube, Square Astm-A513, 6 in. X 6 in. X 3/8 in. (0.375) Wall.

BULK MATERIAL

Steel Tube 6 in. X 6 in. X 3/8 in. (0.375) Square ASTM-A513



HETT0690

FIGURE F-3. BATTERY TERMINAL COVER (SW34329)**NOTE**

1. Alter Cover as Shown.
2. Make From: Waytek Part Number 23513 Battery Cable Boot (Color: Red) (Cage 58961) NSN (Gf -Tbs).

SW34329 Battery Terminal Cover

BULK MATERIAL

Waytek, Battery Cable Boot (Red) - NSN (GFI-TBS) 23513 58961

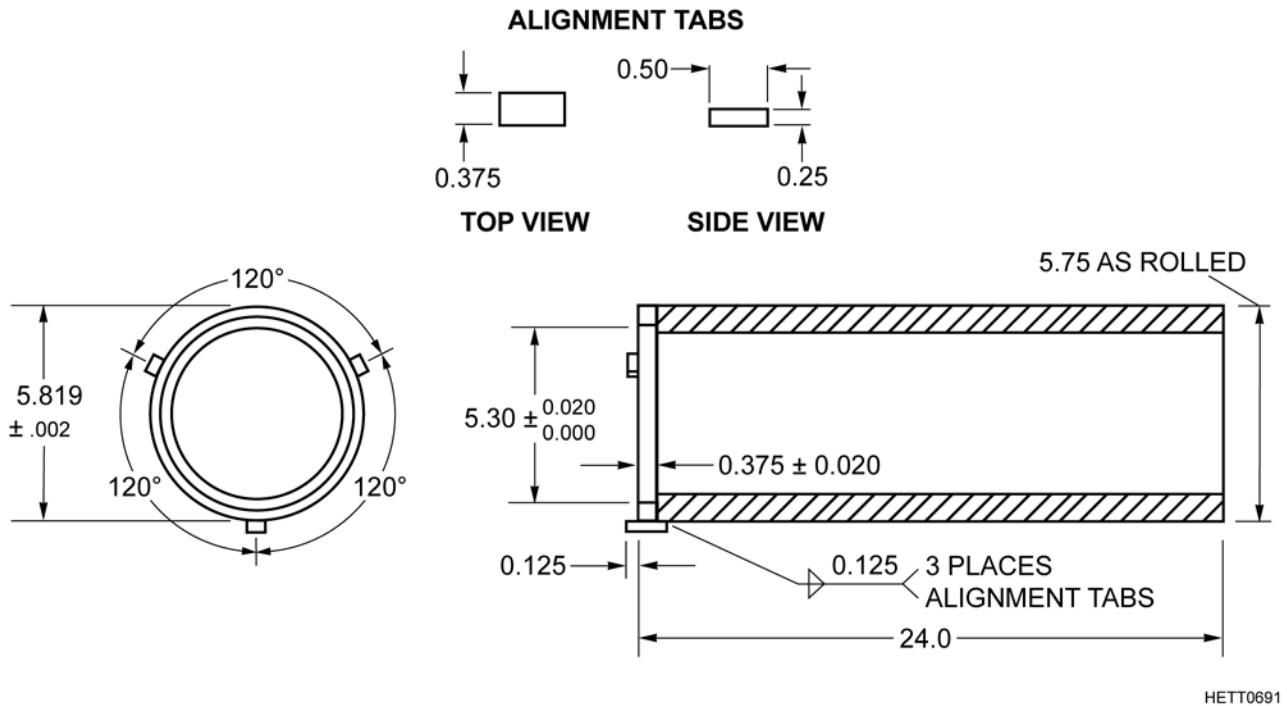


FIGURE F-4. BEARING SEATING TOOL (T4249)

NOTE

1. All Dimensions Are in Inches.
2. Dimensions Without Tolerances Are Not Considered Critical.
3. Remove All Burrs and Sharp Edges.
4. Fabricate From: Tube Steel, Round ASTM-A513 5-3/4 (5.750) in. DIA. X 1/4 (0.250) in Wall.
Tab NSN: Steel, Plate, C1045 1/4 (0.250) in. Thick.
5. All Machined Surfaces Should Have a Minimum of 0.125 Finish.
6. Make All Welds Per AWS-1.1.

T4249 Bearing Seating Tool

BULK MATERIAL

Tube Steel, Round 5 3/4 (5.750) in ASTM-A513

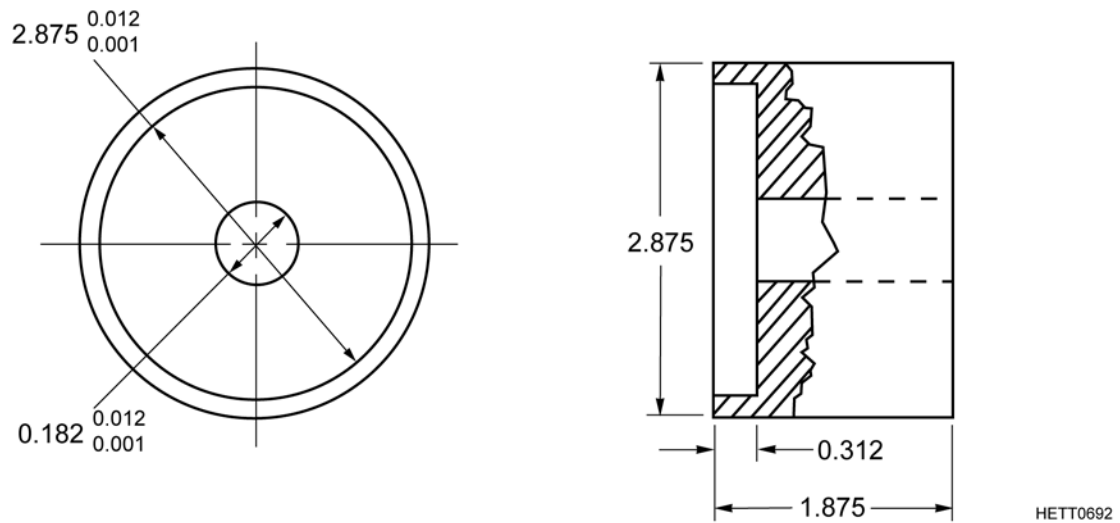


FIGURE F-5. BUSHING PULLER (SW34348-3)

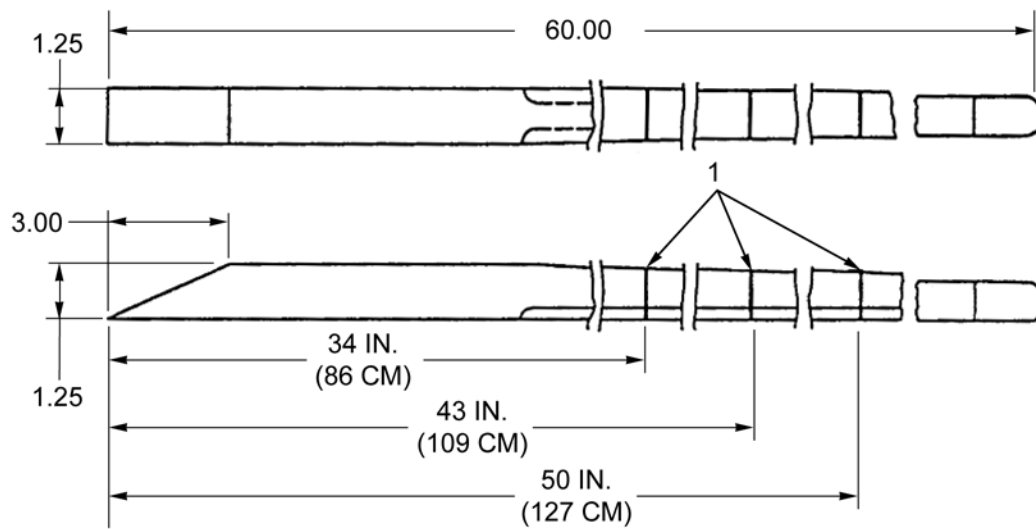
NOTE

1. All Dimensions Are in Inches Except as Noted.
2. Dimensions Without Tolerances Are Not Considered Critical.
3. Remove All Burrs and Sharp Edges.
4. All Machined Surfaces Should Have a Minimum of 125 Finish.
5. Fabricate From: Steel Bar ASTM A 108, DIA 2.875 NSN (GFI-TBS).

SW34348-3 Bushing Puller

BULK MATERIAL

Steel Bar, DIA 2.875 in. NSN (GFI-TBS) ASTM A108



HETT0693

FIGURE F-6 CROWBAR (SW32540)**NOTE**

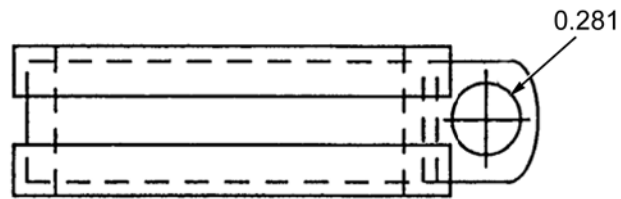
1. All Dimensions Are in Inches Except as Noted.
2. Dimensions Without Tolerances Are Not Considered Critical.
3. Remove All Burrs and Sharp Edges.
4. Fabricate From: NSN 5120-00-224-1390.
5. Scribe the Entire Circumference at Three Locations Shown (1), Using Pneumatic Grinder With a 1/8 in. (0.318 cm) Cutting Wheel. These Marks Are Used for Measuring Various Platform Heights During Normal Operations.

SW32540 Crowbar

BULK MATERIAL

NSN 5120-00-224-1390

Cutting Wheel 1/8 in. (0.318 cm)



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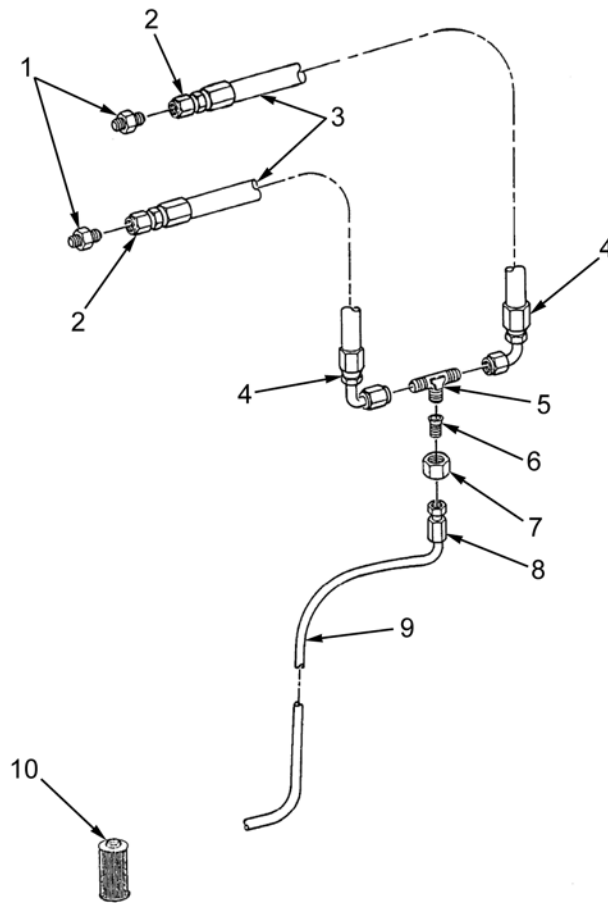
FIGURE F-7. DOUBLE LOOP CLAMP (SW32910)**NOTE**

1. All Dimensions Are in Inches Except as Noted.
2. Dimensions Without Tolerances Are Not Considered Critical.
3. Remove All Burrs and Sharp Edges.
4. Fabricate From: Clamp, Double Loop, MS21334-32.

SW32910 Double Loop Clamp

BULK MATERIAL

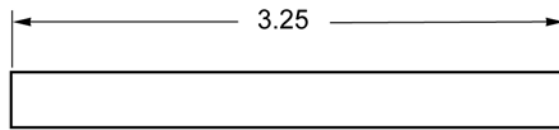
Clamp, Double Loop MS21334-32



HETT0695

FIGURE F-8. FLUSHING HOSE KIT (SW34434)**BULK MATERIAL**

- Union Adapter (Figure F-8, Item 1) 10-12-070101 (2 ea)
- Tube-to-Hose Adapter (Figure F-8, Item 2) 10-10-250143, NSN 4730-01-357-8705 (2 ea)
- Hose (Figure F-8, Item 3) FC510-10, NSN 4720-01-359-1012 (51 in.)
- Tube Elbow-to-Hose (Figure F-8, Item 4) 10-10-251443, NSN 4730-01-332-8486 (2 ea)
- Union Tee (Figure F-8, Item 5) 10-10-070401, NSN 4730-00-784-2633 (1 ea)
- Reducer Adapter (Figure F-8, Item 6) 10-6-(TBS) NSN 4730-00-999-9830 (1 ea)
- Fitting Nut (Figure F-8, Item 7) 10-(TBS) NSN 4730-00-976-0981 (1 ea)
- Tube-to-Hose Adapter (Figure F-8, Item 8) 6-6-250143, NSN (TBS) (1 ea)
- Hose (Figure F-8, Item 9) FC510-6, NSN 4720-01-369-4890 (75 ft)
- Filter (Figure F-8, Item 10) FK-010-HG-B, NSN (TBS) (6)



HETT0696

FIGURE F-9. FUEL GAUGE TUBE (SW34353-2)**NOTE**

1. All Dimensions Are in Inches.
2. Dimensions Without Tolerances Are Not Considered Critical.
3. Fabricate From: Thermoplastic, Translucent Yellow (CAGE 1 DS07) AAG00012.

SW34353-2 Fuel Gauge Tube

BULK MATERIAL

Thermoplastic, Translucent Yellow AAG00012 1 DS07 (3.25 in.)

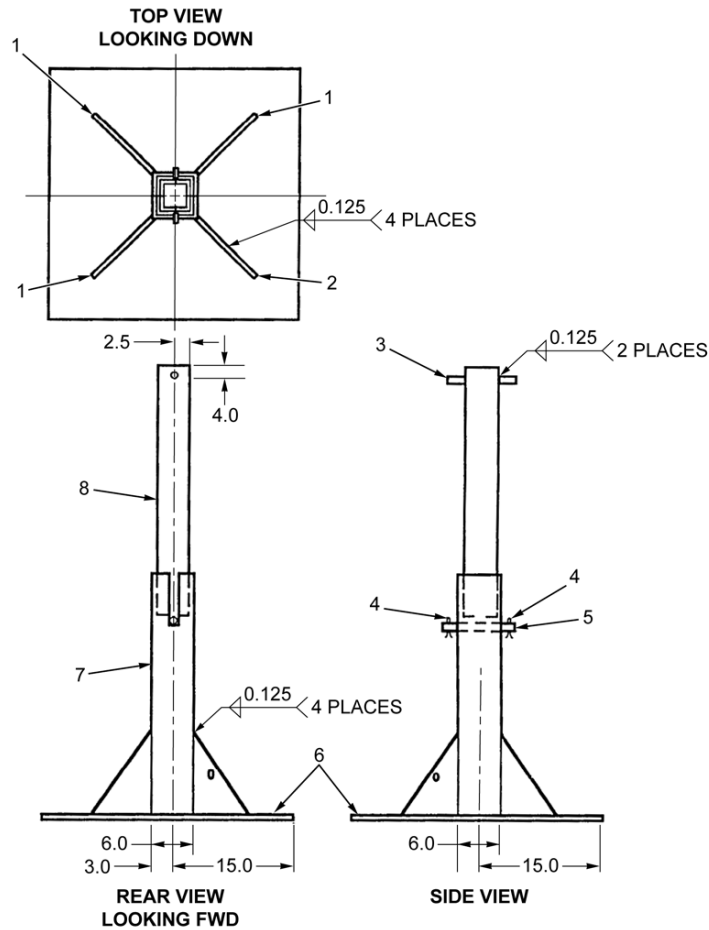


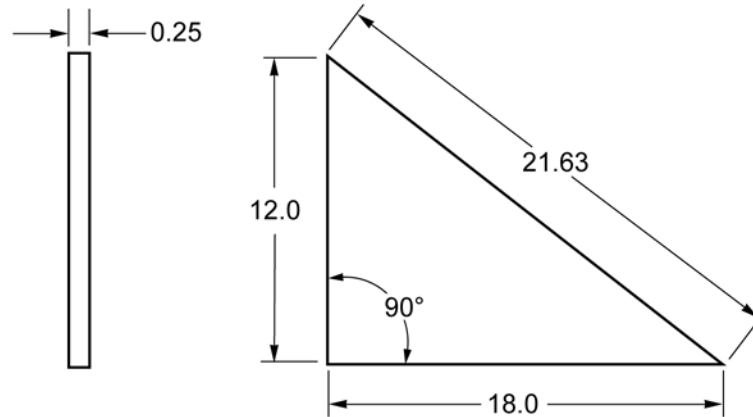
FIGURE F-10. GOOSENECK SUPPORT STAND

NOTE

1. All Dimensions Are in Inches Except as Noted.
2. Dimensions Without Tolerances Are Not Considered Critical.
3. Remove All Burrs and Sharp Edges.
4. Make All Welds Per AWS-1.1.
5. Obtain All Parts and Assemble as Shown.

BULK MATERIAL

Gusset, Figure F-11 (0.125 in.) (Figure F-10, Item 1) C-1045 (3)
 Gusset, Figure F-12 (0.125 in.) (Figure F-10, Item 2) C-1045 (1)
 Handle, Figure F-13 (Figure F-10, Item 3) NSN 9510-00-061-6607 (2)
 Safety Pin (Figure F-10, Item 4) NSN 5315-00-421-4921 (2)
 Retainer Pin, Figure F-16 (Figure F-10, Item 5) NSN 9510-00-061-6607 (1)
 Base Plate, Figure F-1 (0.125 in.) (Figure F-10, Item 6) C-1045 (1)
 Base Tube, Figure F-2 (6 in. X 6 in. X 3/8 in. (0.375) (Figure F-10, Item 7) Square ASTM-A513 (1)
 Support Tube, Figure F-17 (5 in. X 5 in. X 3/8 (0.375) in. (Figure F-10, Item 8) Square, ASTM-A513 (1)



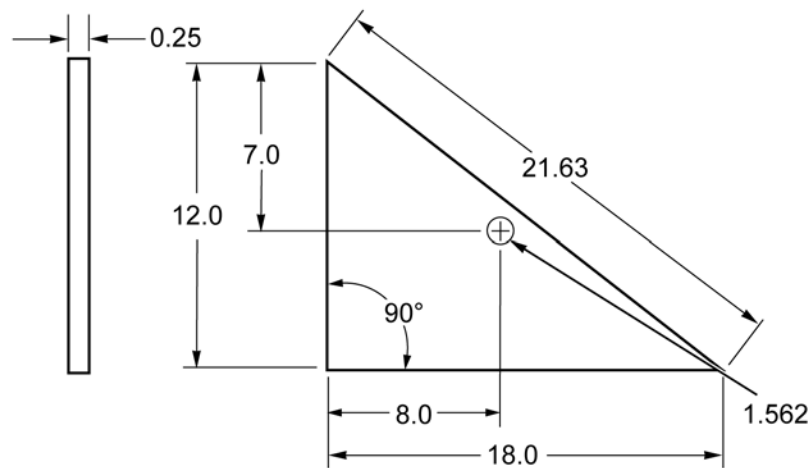
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FIGURE F-11. GUSSET**NOTE**

1. All Dimensions Are in Inches Except as Noted.
2. Dimensions Without Tolerances Are Not Considered Critical.
3. Remove All Burrs and Sharp Edges.
4. Fabricate From: Steel Plate, C-1045, 1/4 (0.250) in. Thick.

BULK MATERIAL

Steel Plate, 1/4 (0.250) in. C-1045 (1)



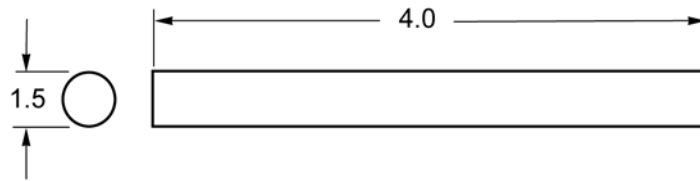
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FIGURE F-12. GUSSET**NOTE**

1. All Dimensions Are in Inches Except as Noted.
2. Dimensions Without Tolerances Are Not Considered Critical.
3. Remove All Burrs and Sharp Edges.
4. Fabricate From: Steel Plate, C-1045, 1/4 (0.250) in. Thick. Drill Thru Ø Diameter 1.562.

BULK MATERIAL

Steel Plate, 1/4 (0.250) in. C-1045 (1)



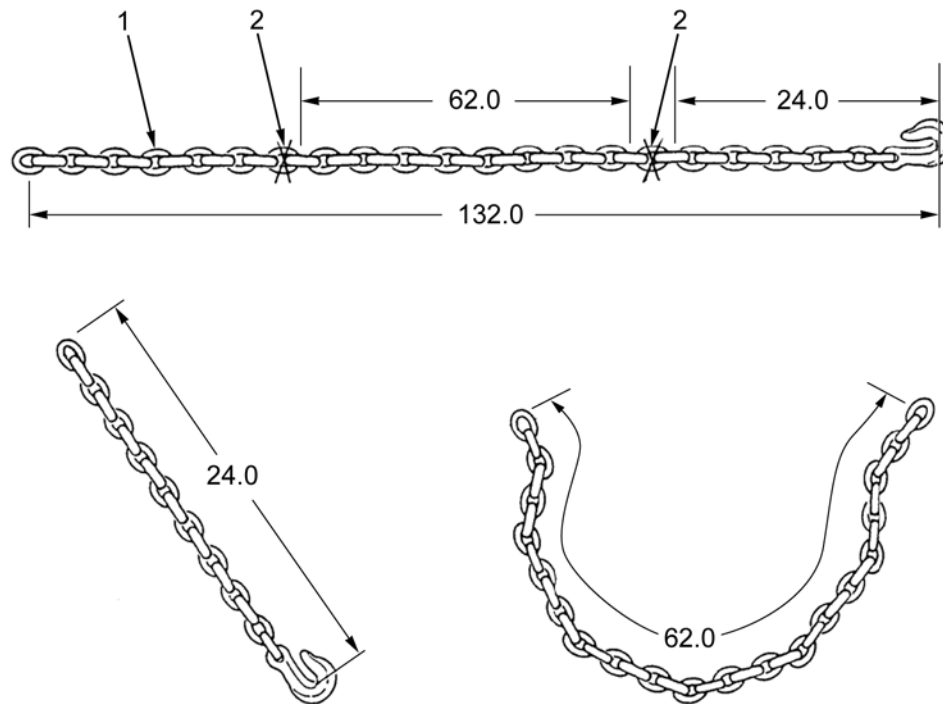
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FIGURE F-13. HANDLE**NOTE**

1. All Dimensions Are in Inches Except as Noted.
2. Dimensions Without Tolerances Are Not Considered Critical.
3. Remove All Burrs and Sharp Edges.
4. Fabricate From: NSN 9510-00-061-6607.

BULK MATERIAL

NSN 9510-00-061-6607 (4 in.)



HETT0701

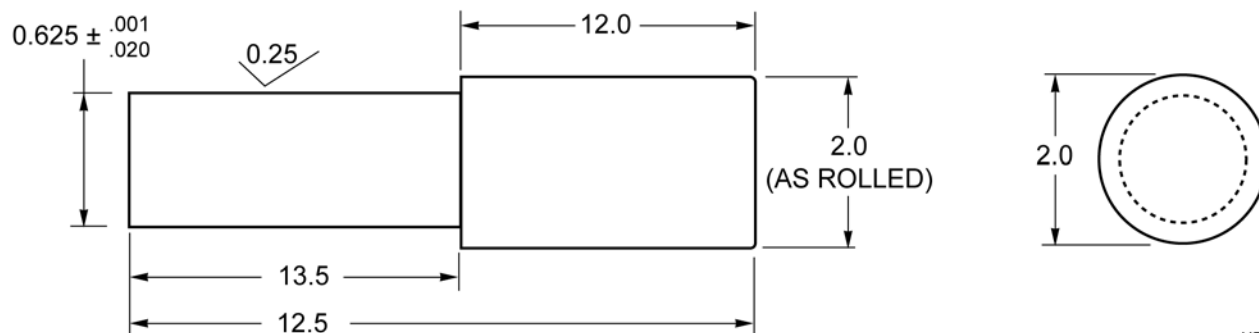
FIGURE F-14. HYDRAULIC CONTROL MODULE REMOVAL/INSTALLATION CHAIN SET (SW34435)**NOTE**

1. All Dimensions Are in Inches.
2. Fabricate From: NSN 4010-01-361-7267.
3. Cut Chain (1) into Two Pieces as Illustrated (2).
4. Discard Excess Chain.

SW34435 Hydraulic Control Module Removal/Installation Chain Set

BULK MATERIAL

Chain 4010-01-361-7267 (132 in.)



HETT0702

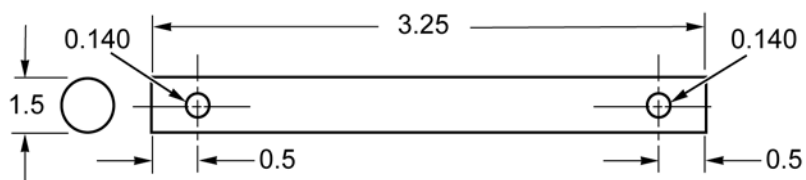
FIGURE F-15. REMOVAL TOOL (SUSPENSION CYLINDER PIN) (SW34436)**NOTE**

1. All Dimensions Are in Inches Except as Noted.
2. Dimensions Without Tolerances Are Not Considered Critical.
3. Remove All Burrs and Sharp Edges.
4. Fabricate From: NSN 5910-00-229-4835.
5. All Machined Surfaces Should Have a Minimum of 0.125 Finish.

SW34436 Removal Tool (Suspension Cylinder Pin)

BULK MATERIAL

Figure F-15, Item 12 in. as Rolled NSN 5910-00-229-4835



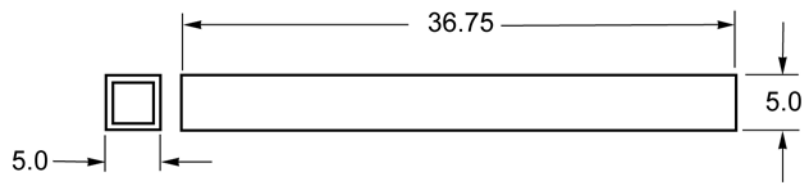
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FIGURE F-16 RETAINER PIN**NOTE**

1. All Dimensions Are in Inches Except as Noted.
2. Dimensions Without Tolerances Are Not Considered Critical.
3. Remove All Burrs and Sharp Edges.
4. Fabricate From: NSN 9510-00-061-6607. Drill through 0.140 Ø Drill Bit 2 places.

BULK MATERIAL

NSN 9510-00-061-6607 (8 in.)



HETT0704

FIGURE F-17. SUPPORT TUBE**NOTE**

1. All Dimensions Are in Inches Except as Noted.
2. Dimensions Without Tolerances Are Not Considered Critical.
3. Remove All Burrs and Sharp Edges.
4. Fabricate From: Steel Tube, Square, ASTM-A513, 5 in. X 5 in. X 3/8 (0.375) in. Wall.

BULK MATERIAL

Steel Tube, Square 5 in. X 5 in. X 3/8 (0.375) in. ASTM-A513 (36.75 in.)

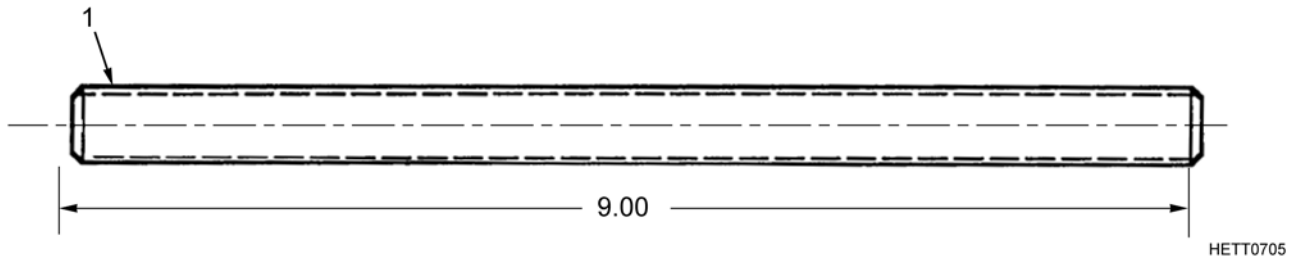


FIGURE F-18. THREAD ROD (SW34348-7)

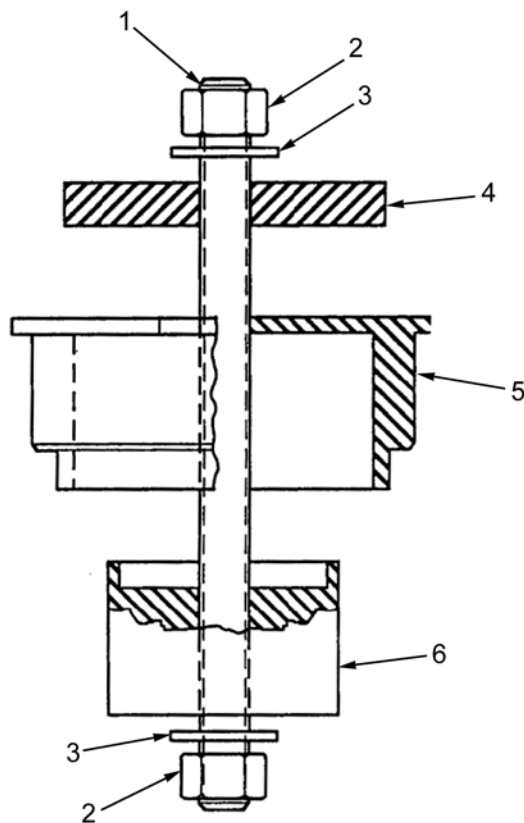
NOTE

1. All Dimensions Are in Inches Except as Noted.
2. Dimensions Without Tolerances Are Not Considered Critical.
3. Remove All Burrs and Sharp Edges.
4. Fabricate From: NSN 5306-00-286-9258.

SW34348-7 Thread Rod

BULK MATERIAL

0.75-16 UNF 2 (Figure F-18, Item 1) NSN 5306-00-286-9258 (9 in.)



HETT0706

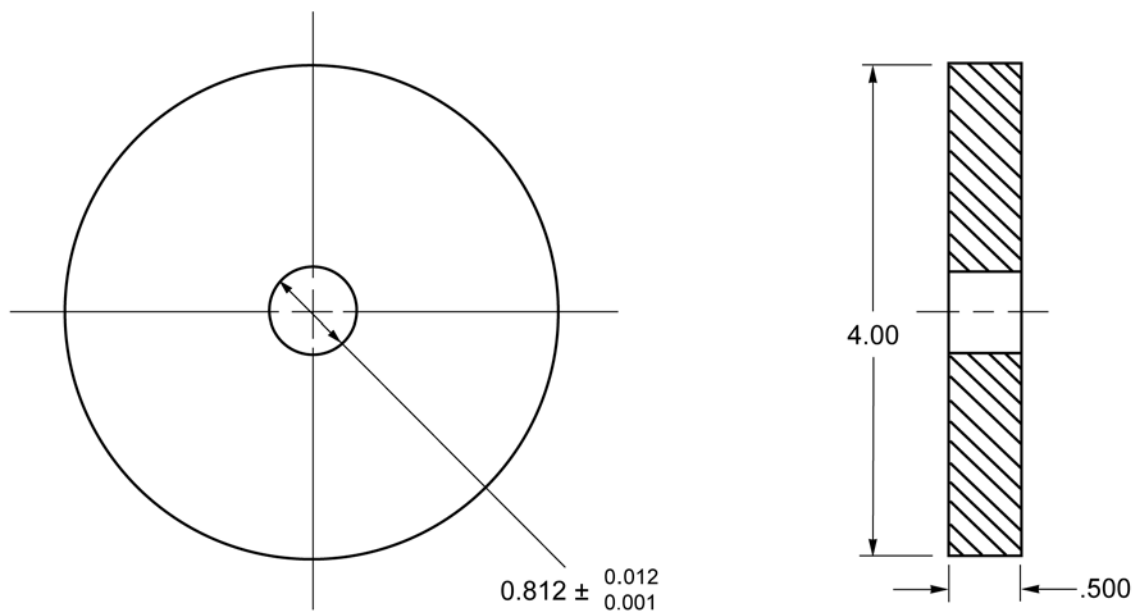
FIGURE F-19. URETHANE BUSHING REMOVAL/INSTALLATION TOOL (SW34348)**NOTE**

1. Obtain All Parts and Assemble as Illustrated.

SW34348 Urethane Bushing Removal/Installation Tool

BULK MATERIAL

- Thread Rod (Figure F-19, Item 1) SW34348-7 (1)
- Nut Plain (Figure F-19, Item 2) MS51968-23 (2)
- Washer (Figure F-19, Item 3) MS27183-23 (2)
- Washer (Figure F-19, Item 4) SW34348-5 (1)
- Bushing (Figure F-19, Item 5) NSN 3120-01-334-4770 (1)
- Bushing Puller (Figure F-19, Item 6) SW34348-3 (1)



HETT0707

FIGURE F-20. WASHER (SW34348-5)**NOTE**

1. All Dimensions Are in Inches Except as Noted.
2. Dimensions Without Tolerances Are Not Considered Critical.
3. Remove All Burrs and Sharp Edges.
4. All Machined Surfaces Should Have a Minimum of 0.125 Finish.
5. Fabricate From: NSN 9510-00-229-4840.

SW34348-5 Washer

BULK MATERIAL

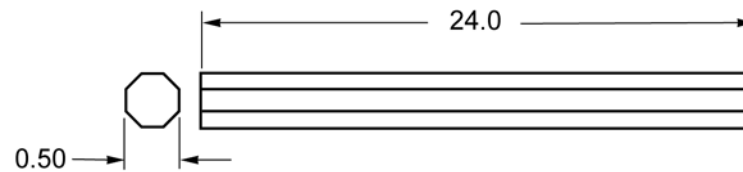
NSN 9510-00-229-4840 (4 in.)

FROM	BEGINNING CONNECTOR TYPE	AWG	COLOR	LENGTH INCHES (CM)	BULK WIRE PART NUMBER	ENDING CONNECTOR TYPE	TO
GOOSENECK COMPONENT ASSEMBLY							
R1-2	OPEN END SOLDERED	#12	WHT/YEL	14.0 (35.6)	M16878/2BLE94	MS25036-112	TB2-A7
R2-2	MS25036-154	#12	WHT/BRN	8.0 (20.3)	M16878/2BLE91	MS25036-112	TB2-A1
R3-2	OPEN END SOLDERED	#12	WHT/GRN	9.0 (22.9)	M16878/2BLE95	MS25036-112	TB2-A9
TB2-A6	MS25036-112	#12	WHT/BLK	6.0 (15.2)	M16878/2BLE90	MS25036-112	TB2-A3
TB2-A10	MS25036-112	#12	WHT/BRN	6.0 (15.2)	M16878/2BLE91	MS25036-112	TB2-A2
APU CONTROL BOX							
DIODE	42643-2	#14	RED	6.0 (15.2)	R-59083	MS25036-108	START SWITCH B
START SWITCH GL	MS25036-112	#10	BLK/RED	8.0 (20.3)	R-60934	MS25036-112	GLOW PLUG INDICATOR
INDICATOR LIGHT							
OIL PR SEND UNIT	324225	#14	BLU	3.0 (7.6)	R-59138	OPEN END SOLDERED	INDICATOR BASE
CURRENT LIMITER	324225	#14	RED	3.0 (7.6)	R-59083	OPEN END SOLDERED	INDICATOR BASE

HETT0743

FIGURE F-21. WIRE ASSEMBLIES**BULK MATERIAL**

R1-2 — Open End Soldered M16878/2BLE94
 R2-2 — M25036-154 M16878/2BLE91
 R3-2 — Open End Soldered M16878/2BLE95
 TB2-A6 — MS25036-112 M16878/2BLE90
 TB2-A10 — MS25036-112 M16878/2BLE91
 Diode — 42643-2 R-59083
 Start Switch GL — MS25036-112 R-60934
 Oil PR Send Unit — 324225 R-59138
 Current Limiter — 324225 R-59083



HETT0708

FIGURE F-22. HEXAGON STOCK, 1/2 IN.**NOTE**

1. All Dimensions Are in Inches Except as Noted.
2. Dimensions Without Tolerances Are Not Considered Critical.
3. Remove All Burrs and Sharp Edges.
4. Fabricate From: 9510-00-204-1035 Or 9510-00-294-9665.

BULK MATERIAL

1/2 in. Hex Bar Stock NSN 9510-00-204-1035 or 9510-00-294-9665 (24 in.)

END OF WORK PACKAGE

FIELD MAINTENANCE

TORQUE LIMITS

SCOPE

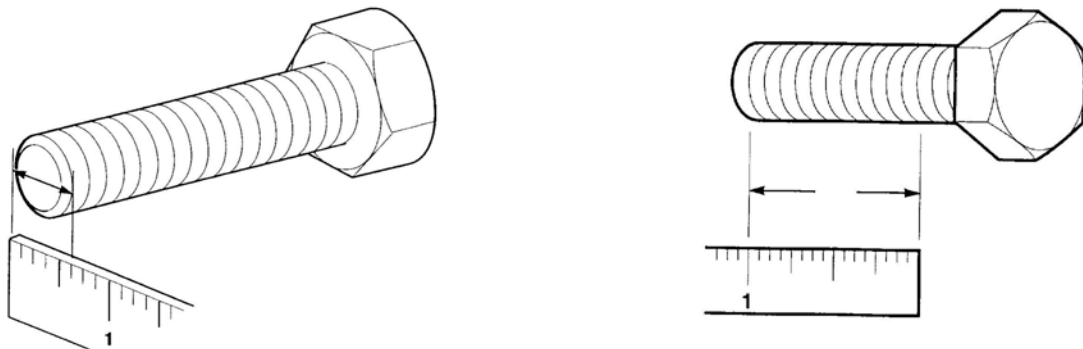
This work package provides general torque limits for the screws, hoses, and fittings used on the semitrailer. Special torque limits are listed in the maintenance procedures for applicable components. The general torque limits given in this work package shall be used when specific torque limits are not indicated in the maintenance procedure. These general torque limits cannot be applied to screws that retain rubber components. The rubber components will be damaged before the torque limit is reached. If a special torque limit is not given in the maintenance instructions, tighten the screw or nut until it touches the metal bracket, and then tighten it one more turn.

TORQUE TABLES

HOW TO USE THE TORQUE TABLE

Screws and Nuts

1. Measure the diameter of the screw you are installing.



HETT782

Figure 1. Measuring Screw Diameter and Length.

2. Count the number of threads per inch or use a pitch grade (Figure 1).
3. Under the heading size, look down the left-hand column until you find the diameter of the screw you are installing. (There will usually be two lines beginning with the same size for SAE, Metric is one).
4. In the second column for SAE under SIZE in Table 2 below, find the number of threads per inch that matches the number of threads you counted in Step 2. (This step is not required for Metric screws/bolts).

NOTE

Manufacturers mark may vary. Standard are all SAE Grade 5 (3-Line). Metric screws are of three grades 8.8, 10.9, and 12.9. Grades and manufactures marks appear on the top of the screw head.

5. To find the grade screw you are installing, match the markings on the head to the correct picture of Capscrew Head Markings in (Figure 2, and Figure 3) before each torque table.

DRY TORQUE LIMITS FOR METRIC FASTENERS

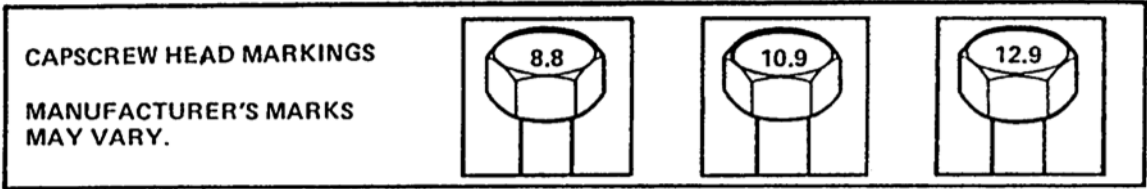


Figure 2. Dry Torque Limits For Metric Fasteners.

Table 1. Dry Torque Limits For Metric Fasteners.

SIZE		METRIC GRADE 8.8		METRIC GRADE 10.9		METRIC GRADE 12.9	
DIA. IN.	DIA MM	LB-FT	NM	LB-FT	NM	LB-FT	NM
0.157	4	2	3	3	4	4	5
0.197	5	4	5	6	8	7	9
0.237	6	7	9	10	14	11	15
0.315	8	18	24	25	34	29	39
0.394	10	32	43	47	64	58	79
0.473	12	58	79	83	113	100	136
0.630	16	144	195	196	266	235	319
0.709	18	190	258	269	365	323	438
0.788	20	260	353	366	496	440	597
0.867	22	368	499	520	705	678	919
0.946	24	470	637	664	900	794	1077
1.064	27	707	959	996	1351	1235	1675
1.182	30	967	1311	1357	1840	1630	2210

DRY TORQUE LIMITS FOR SAE FASTENERS

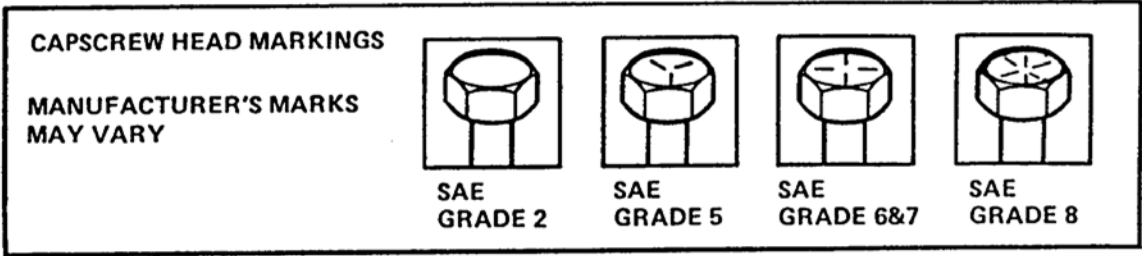


Figure 3. Dry Torque Limits For SAE Fasteners.

Table 2. Dry Torque Limits For SAE Fasteners.

SIZE			SAE GRADE NO. 2		SAE GRADE NO. 5		SAE GRADE NO. 6 OR 7		SAE GRADE NO. 8	
DIA. IN.	THREAD PER INCH	DIA MM	LB-FT	NM	LB-FT	NM	LB-FT	NM	LB-FT	NM
1/4	20	6.35	5	7	8	11	10	14	12	16
1/4	28	6.35	6	9	10	14	12	16	14	19
5/16	18	7.94	11	15	17	23	21	28	25	34
5/16	24	7.94	12	16	19	26	24	33	25	34
3/8	16	9.53	20	27	30	41	40	54	45	61
3/8	24	9.53	23	31	35	47	45	61	50	68
7/16	14	11.11	30	41	50	68	60	81	70	95
7/16	20		35	47	55	75	70	95	90	108
1/2	13	12.70	50	68	75	102	95	129	110	149
1/2	20		55	75	90	122	100	135	120	163
9/16	12	14.29	65	85	110	149	135	182	150	203
9/16	18		75	102	120	163	150	203	170	231
5/8	11	15.88	90	122	150	203	190	258	220	298
5/8	18		100	136	180	244	210	285	240	325
3/4	10	19.05	160	217	260	353	240	434	380	515
3/4	16		180	244	300	407	360	488	420	597
7/8	9	22.23	140	190	400	542	520	705	600	814
7/8	14		155	210	440	597	580	786	660	895
1	8	25.40	220	298	580	786	800	1085	900	1220
1	12		240	325	640	868	860	1166	1000	1350
1 - 1/8	7	25.58	300	407	800	1085	1120	1519	1280	1736
1 - 1/8	12		340	461	880	1193	1260	1709	1440	1953
1 - 1/4	7	31.75	420	570	1120	1519	1580	2142	1820	2468
1 - 1/4	12		460	624	1240	1681	1760	2387	2000	2712
1 - 3/8	6	34.93	560	759	1460	1980	2080	2820	2380	3227
1 - 3/8	12		640	868	1680	2278	2360	3227	2720	3688
1 - 1/2	6	38.10	740	1003	1940	2631	2780	3770	3160	4285
1 - 1/2	12		840	1139	2200	2983	3100	4204	3560	4827

END OF WORK PACKAGE

CHAPTER 6
SUPPORTING INFORMATION
FOR
SEMITRAILER, TRANSPORTER, HEAVY EQUIPMENT 70 TON, M1000

FIELD MAINTENANCE**REFERENCES**

Scope

This work package lists forms, field manuals, technical manuals, and other publications that are referenced in this manual and that apply to the operation and maintenance of the M1000 semitrailer.

DEPARTMENT OF THE ARMY PAMPHLETS

DA PAM 25-30	Consolidated Index of Army Publications and Blank Forms
DA PAM 710-2-1	Unit Supply - Manual Procedures (Unit Supply UPDATE)
DA PAM 738-750	The Army Maintenance Management System (TAMMS)

FORMS

DA Form 2028	Recommended Changes to Publications and Blank Forms
DA Form 2028-2	Recommended Changes to Equipment Technical Publications
DA Form 2401	Organizational Control Record for Equipment
DA Form 2404	Equipment Inspection and Maintenance Worksheet
DA Form 2407	Maintenance Request
DD Form 314	Preventive Maintenance Schedule and Record
SF 369	Product Quality Deficiency Report (NSN 7540-00-105-0078)
DD Form 6	Packaging Improvement Report

FIELD MANUALS

FM 3-3	NBC Contamination Avoidance
FM 3-4	NBC Protection
FM 3-5	NBC Decontamination
FM 20-3	Camouflage
FM 9-207	Operation and Maintenance of Ordnance Materiel in Cold Weather (0° Deg to Minus 65° Deg F)
FM 21-11	First Aid for Soldiers
FM 21-305	Manual for the Wheeled Vehicle Driver
FM 31-70	Basic Cold Weather Manual
FM 31-71	Northern Operations
FM 55-30	Army Motor Transport Units and Operations
	FM 90-3 Desert Operations (How to Fight)
FM 90-6	Mountain Operations (How to Fight)

TECHNICAL BULLETINS

TB 9-2300-247-40	Tactical Wheeled Vehicles: Repair of Frames
TB 43-0001-39 Series	Equipment Improvement Report and Maintenance Digest (US Army Tank-Automotive Command) Tank-Automotive Equipment
TB 43-0142	Safety Inspection and Testing of Lifting Devices
TB 43-0209	Color, Marking, and Camouflage Painting of Military Vehicles, Construction Equipment, and Materials Handling Equipment
TB 43-0211	Army Oil Analysis Program
TB 43-0239	Maintenance in the Desert
TB 43-0242	CARC Spot Painting
TB ORD 1032	Description, Use, Bonding Techniques, and Properties of Adhesives

TECHNICAL MANUALS

TM 9-214	Inspection, Care, and Maintenance of Antifriction Bearings
TM 9-237	Operator's Manual for Welding Theory and Application
TM 9-247	Materials Used for Cleaning, Preserving, Abrading, and Cementing Ordnance Materiel and Related Materials, Including Chemicals

TM 9-2330-381-24P	Organizational, Direct Support, and General Support Repair Parts and Special Tools List for Semitrailer, Heavy Equipment, 70 Ton, M1000
TM 9-2320-360-10	Operator's Manual for Truck, Tractor, M1070, 8 X 8, Heavy Equipment Transporter (HET)
TM 9-2320-270-10	Operator's Manual for Truck, Tractor, Commercial Heavy Equipment Transporter (C-HET), 85,000 GVWR, 8 X 6, M911
TM 9-2610-200-14	Operator's, Unit, Direct Support, and General Support Maintenance Manual for Care, Maintenance, Repair, and Inspection of Pneumatic Tires and Inner Tubes
TM 9-4910-743-14&P	Operator, Organizational, Direct Support and General Support Maintenance Manual Including Repair Parts List for Balancer, Vehicle Wheel, Model M-76
TM 9-6140-200-14	Operator's, Unit, Direct Support, and General Support Maintenance Manual for Lead-Acid Storage Batteries
TM 43-0139	Painting Instructions for Army Materiel
TM 750-244-6	Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use

SPECIFICATION AND STANDARDS

Fed Spec P-D-680	Dry Cleaning Solvent
TT-M-261	Methyl Ethyl Ketone
MIL-I-6866	Inspection, Liquid Penetrant Methods
MIL-I-6868	Inspection Process, Magnetic Particles
MIL-STD-1472	Human Engineering Design Criteria for Military Systems, Equipment, and Facilities

OTHER PUBLICATIONS

CTA 8-100	Army Medical Department Expendable/Durable Items
CTA 50-970	Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items)
CTA 50 909	Field and Garrison Furnishings and Equipment

END OF WORK PACKAGE

FIELD MAINTENANCE

MAINTENANCE ALLOCATION CHART (MAC) INTRODUCTION

THE ARMY MAINTENANCE SYSTEM (MAC)

This introduction provides a general explanation of all maintenance and repair functions authorized at the two maintenance levels under the Two-Level Maintenance System concept.

The Maintenance Allocation Chart (MAC) (immediately following the introduction) designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component shall be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

- Field – includes two subcolumns, Crew (C) and Maintainer (F).
- Sustainment – includes two subcolumns, Below Depot (H) and Depot (D).

The maintenance to be performed at field and sustainment levels is described as follows:

1. Crew maintenance. The responsibility of a using organization to perform maintenance on its assigned equipment. It normally consists of inspecting, servicing, lubricating, adjusting, and replacing parts, minor assemblies, and subassemblies. The replace function for this level of maintenance is indicated by the letter "C" in the third position of the Source, Maintenance, and Recoverability (SMR) code. A "C" appearing in the fourth position of the SMR code indicates complete repair is possible at the crew maintenance level.
2. Maintainer maintenance. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter "F" appearing in the third position of the SMR code. An "F" appearing in the fourth position of the SMR code indicates complete repair is possible at the field maintenance level. Items are returned to the user after maintenance is performed at this level.
3. Below depot sustainment. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter "H" appearing in the third position of the SMR code. An "H" appearing in the fourth position of the SMR code indicates complete repair is possible at the below depot sustainment maintenance level. Items are returned to the supply system after maintenance is performed at this level.
4. Depot sustainment. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter "D" or "K" appearing in the third position of the SMR code. Depot sustainment maintenance can be performed by either depot personnel or contractor personnel. A "D" or "K" appearing in the fourth position of the SMR code indicates complete repair is possible at the depot sustainment maintenance level. Items are returned to the supply system after maintenance is performed at this level.

The tools and test equipment requirements table (immediately following the MAC) lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from the MAC.

The remarks table (immediately following the tools and test equipment requirements) contains supplemental instructions and explanatory notes for a particular maintenance function.

MAINTENANCE FUNCTIONS

Maintenance functions are limited to and defined as follows:

1. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel). This includes scheduled inspection and gauging and the evaluation of cannon tubes.
2. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards on a scheduled basis, i.e., load testing of lift devices and hydrostatic testing of pressure hoses.

3. Service. Operations required periodically to keep an item in proper operating condition, e.g., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases. This includes scheduled exercising and purging of recoil mechanisms. The following are examples of service functions:
 - a. Unpack. To remove an item from packing box for service or when required for the performance of maintenance operations.
 - b. Repack. To return an item to packing box after service and other maintenance operations.
 - c. Clean. To rid the item of contamination.
 - d. Touch up. To spot paint scratched or blistered surfaces.
 - e. Mark. To restore obliterated identification.
4. Adjust. To maintain or regulate, within prescribed limits, by bringing an item into proper position, or by setting the operating characteristics to specified parameters.
5. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.
6. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments of test, measuring, and diagnostic equipment used in precision measurement. This function consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.
7. Remove/Install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of equipment or a system.
8. Paint (ammunition only). To prepare and spray color coats of paint so that the ammunition can be identified and protected. The color indicating primary use is applied, preferably, to the entire exterior surface as the background color of the item. Other markings are to be repainted as original so as to retain proper ammunition identification.
9. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC, and the assigned maintenance level is shown as the third position of the SMR code.
10. Repair. The application of maintenance services, including fault location/troubleshooting, removal/installation, disassembly/assembly procedures, and maintenance actions to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

NOTE

The following definitions are applicable to the "repair" maintenance function:

- Services. Inspect, test, service, adjust, align, calibrate, and/or replace.
 - Fault location/troubleshooting. The process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or Unit Under Test (UUT).
 - Disassembly/assembly. The step-by-step breakdown (taking apart) of a spare/functional group-coded item to the level of its least component, which is assigned an SMR code for the level of maintenance under consideration (i.e., identified as maintenance significant).
 - Actions. Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.
11. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to a like-new condition.
 12. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like-new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/miles) considered in classifying Army equipment/components.

EXPLANATION OF COLUMNS IN THE MAC.

1. Column (1) Group Number. Column (1) lists Functional Group Code (FGC) numbers, the purpose of which is to identify maintenance-significant components, assemblies, subassemblies, and modules with the Next Higher Assembly (NHA).
2. Column (2) Component/Assembly. Column (2) contains the item names of components, assemblies, subassemblies, and modules for which maintenance is authorized.
3. Column (3) Maintenance Function. Column (3) lists the functions to be performed on the item listed in column (2). (For a detailed explanation of these functions, refer to "Maintenance Functions" outlined above.)
4. Column (4) Maintenance Level. Column (4) specifies each level of maintenance authorized to perform each function listed in column (3), by indicating the work time required (expressed as man-hours in whole hours or decimals) in the appropriate subcolumn. This work time figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance levels, appropriate work time figures are to be shown for each level. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the MAC. The symbol designations for the various maintenance levels are as follows:

Field:

C Crew maintenance

F Maintainer maintenance

Sustainment:

L Specialized Repair Activity (SRA)

H Below depot maintenance

D Depot maintenance

NOTE

The "L" maintenance level is not included in column (4) of the MAC. Functions to this level of maintenance are identified by work time figure in the "H" column of column (4), and an associated reference code is used in the Remarks column (6). This code is keyed to the remarks, and the SRA complete repair application is explained there.

5. Column (5) Tools and Equipment Reference Code. Column (5) specifies, by code, those common tool sets (not individual tools), common Test, Measurement, and Diagnostic Equipment (TMDE), and special tools, special TMDE, and special support equipment required to perform the designated function. Codes are keyed to the entries in the tools and test equipment table.
6. Column (6) Remarks Code. When applicable, this column contains a letter code, in alphabetical order, that is keyed to the remarks table entries.

EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS

1. Column (1) Tool or Test Equipment Reference code. The tool or test equipment reference code correlates with a code used in column (5) of the MAC.
2. Column (2) Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.
3. Column (3) Nomenclature. Name or identification of the tool or test equipment.
4. Column (4) National Stock Number (NSN). The NSN of the tool or test equipment.
5. Column (5) Tool Number. The manufacturer's part number.

EXPLANATION OF COLUMNS IN REMARKS

1. Column (1) Remarks Code. The code recorded in column (6) of the MAC.

2. Column (2) Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC.

END OF WORK PACKAGE

FIELD MAINTENANCE

MAINTENANCE ALLOCATION CHART

Table 1. MAC for Heavy Equipment Transporter (HET) Semitrailer.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAIN- TAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
00 0000	PMCS Preoperative PMCS Inspection	INSPECT	0.5					
0000	During Operation PMCS Inspection	INSPECT	0.5					
0000	Post Operative PMCS Inspection	INSPECT	0.5					
0000	Weekly PMCS Inspection	INSPECT	0.5					
0000	Quarterly PMCS Inspection	INSPECT		1.0				
0000	Semi-Annual PMCS Inspection	INSPECT						
0000	Annual PMCS Inspection	INSPECT		8.3				
0001	APU Crankcase, Oil Level, Daily	SERVICE	0.1				5	C
0001	APU Oil Drain/Filter, Semi-Annual	SERVICE		0.6			5,24	C, D
0002	Hydraulic, Tank Fill, Daily	SERVICE		0.1			5,23	C, D
0002	Hydraulic, Tank Filter, Annual	SERVICE		0.4			5,23	C, D
0003	Fuel Filter, Semi-Annual	REPLACE		0.6			5,24	C, D
0004	APU Throttle Cable, Semi-Annual	SERVICE		0.6			5	C, D
0005	Kingpin and Pickup Plate	SERVICE		0.1			5	C, D
0006	Gooseneck Grease Fittings and Pivot Sheave, Monthly	SERVICE		0.2			5	C, D
0007	Davit Mounting Cup, Winch, and Step Hinge, Monthly	SERVICE		0.2			5	C, D
0008	Cable Guide, Quarterly	SERVICE		0.1			5	C, D
0009	Snatch Block, Monthly	SERVICE		0.3			5	C, D
0010	Spring Guide Rod, Monthly	SERVICE		0.3			5,23	C, D
0011	Ramp Pivot Pin, Monthly	SERVICE		0.4			5,24	C, D
0012	Stowage Compartment Hinge, Semi-Annual	SERVICE		0.4			5,24	C, D
0013	Platform Grease Fitting	SERVICE		0.3			5	C, D
0014	Hydraulic Filter, Annual	SERVICE		0.5			5,24	C, D
0015	Inner and Outer Wheel Bearings, Annual	SERVICE		10.0			5	C, D
0016	Actuator Nut and Rear Support Leg, Actuator, Monthly	SERVICE		0.1			5	C, D
0017	Upper Suspension Bearing and Upper and Lower Cylinder Bearing, S-Cam Retainer, S-Cam Bushing, Slack Adjuster and Suspension Pivot Pins	SERVICE		0.9			5,24	C, D
0018	Upper/Lower Steering Plate Bearing, Five Year	SERVICE		130.			5	C, D
0019	Lower Suspension Bearing, Five Year	SERVICE		50			5	C, D

FIELD MAINTENANCE

Table 1. MAC for Heavy Equipment Transporter (HET) Semitrailer. - Cont.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAIN- TAINER	BELOW DEPOT	DEPOT		
06 0608	ELECTRICAL SYSTEM Gooseneck Component Assembly	REPLACE		0.4			5, 24	C
		REPAIR		0.6			5, 24	C
0608	Junction Boxes	REPLACE		0.5			5, 24	C
0609	Composite Marker Light	REPLACE		0.2			5, 24	C
		REPAIR		0.2			5, 24	C
0609	Vehicular Bar Lamp	REPLACE		0.2			16	C
0609	Stop Light-Tail Light	REPLACE		0.2			5, 24	C
		REPAIR		0.2			5, 24	C
0609	Clearance Lights/Blackout	REPLACE		0.2			24	
		REPAIR		0.2			24	
0609	Indicator Lights	REPLACE		0.2			5, 24	C
0612	Battery Installation	SERVICE		0.2			5, 24	C
		REPLACE		0.2			5, 24	C
0612	Solar Battery Charger	REPLACE		0.5			24	
0613	Wiring Harness Clamp and Grommet Installation	REPLACE		1.0			24	
0613	Jumper Wires	REPAIR		1.0			5, 24	C
0613	Wiring Harness W1	REPLACE		1.4			5, 24	C
		REPAIR		0.3			5, 24	C
0613	Wiring Harness W2	REPLACE		1.5			5, 24	C
		REPAIR		0.5			5, 24	C
0613	Wiring Harness W3	REPLACE		0.4			5, 24	C
		REPAIR		0.3			5, 24	C
0613	Wiring Harness W4	REPLACE		0.4			5, 24	C
		REPAIR		0.2			5, 24	C
0613	Wiring Harness W5	REPLACE		1.5			5, 24	C
		REPAIR		0.3			5, 24	C
0613	APU Wiring Harness	REPLACE		1.5			5, 24	C
		REPAIR		0.3			5, 24	C
11	REAR AXLE							
1100	Axle Suspension Installation	SERVICE		2.0			1,5,16,22,23,24	C
1100	Connecting Link Ridged	REPLACE		4.0			1,5,12,16,22,24	C
1100	Axle Assembly	REPLACE		3.0			3,5,15,24,26	C
1100	Ultra Bushing	SERVICE		0.4			4,5,18,24,26	C
		REPLACE		4.0			4,5,18,24,26	C
1100	Lower Suspension Arm	SERVICE		2.0			5,10,24	C
		REPLACE		1.2			5,10,24	C
		REPAIR		1.4			3,5,17,26	C
1100	Upper Suspension Arm	REPLACE		3.0			1,5,22,24	C
		REPAIR		3.8			5,7,22,24	C
12	BRAKES							
1202	Service Brake Installation	ADJUST		0.5			24	C
		REPLACE		1.4			5, 24	C
1202	S-Cam	REPLACE		1.0			5, 24	C
1202	S-Cam Retainer	REPLACE		1.5			5, 24	C
1206	Slack Adjuster	INSPECT		0.1			5, 24	C
1208	Gooseneck Pneumatic Installation	REPLACE		0.9			24	
		REPAIR		1.5				

FIELD MAINTENANCE

Table 1. MAC for Heavy Equipment Transporter (HET) Semitrailer. - Cont.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE	
			FIELD		SUSTAINMENT				
			CREW	MAIN- TAINER	BELOW DEPOT	DEPOT			
			C	F	H	D			
1208	Platform Pneumatic	REPLACE		7.0			5, 24	C	
	Installation	REPAIR		2.5			5, 24	C	
1208	Gooseneck Cylinder	REPLACE		7.0			5, 24	C	
	Air Reservoir								
1208	Drain Valve	REPLACE		7.0			5, 24	C	
1208	Air Pressure Relay Valve	REPLACE		0.9			5, 24	C	
1208	Check Valve	REPLACE		0.9			5, 24	C	
13	WHEELS AND TRACKS								
1311	Wheel Assembly	REPLACE	1.0				5	B, C	
		REPAIR			1.7			5, 6	C
1311	Hub and Drum	SERVICE		1.0			5, 24	C	
		REPLACE		2.0			5, 24	C	
		REPAIR		2.0			5, 24	C	
1311	Drum Turning	REPAIR		0.5			5	C	
1311	Spare Wheel Assembly	SERVICE	0.5	0.1			5, 6, 24	B, C	
		REPLACE					6, 24	C	
1313	Tire Assembly	REPLACE			1.0			5, 24	C
		REPAIR			1.7			5, 24	C
14	STEERING								
1401	Platform Steering	ALIGN		2.0			5, 24	C	
	Installation								
1401	Connecting Link Ridged	REPLACE		0.7			5, 24	C	
	Sleeve Bearing	REPAIR		2.0			5, 24	C	
1401	Longitudinal Strut	REPLACE		0.7			5, 24	C	
		REPAIR		1.5			5, 24	C	
1401	Platform Steering Cylinder	INSPECT		0.1			5, 24	C	
	Installation	SERVICE		1.2			5, 24	C	
		ADJUST		0.5			5, 24	C	
		ALIGN		0.5			5, 24	C	
		REPLACE		2.0			5, 24	C	
1401	Steering Plate	SERVICE		0.6			5, 24	C	
		REPLACE		3.0			5,6,10,22,24	C	
		REPAIR		1.5			5,6,10,22,24	C	
1405	Gooseneck Steering	SERVICE		1.2					
	Cylinder Installation	REPLACE				2.0	6, 10, 14, 24	C	
1405	Steering Console and	REPLACE		1.5			5, 24	C	
	Slide Shaft Assembly	REPAIR		1.7			5,7,10,13,24	C	
1405	Kingpin and Steering Arm	SERVICE		0.1			2, 22, 24	C	
		REPLACE		1.5			9, 11, 23, 24	C	
		REPAIR		1.7			1, 5, 24	C	
1412	Steering Cylinder Assembly	REPAIR		1.0			3, 5, 24	C	
15	FRAME, TOWING ATTACHMENTS AND DRAWBARS								
1501	Semitrailer Assembly	SERVICE	0.8				5	C	
		SERVICE			1.3			5	C
1501	Loading Ramp Installations	SERVICE			0.5			5, 10, 22, 24	C
		ADJUST			0.5			5, 10, 22, 24	C
		REPLACE		1.5			5, 10, 22, 24	C	
		REPAIR		1.5			5, 10, 22, 24	C	
1501	APU Frame	REPLACE		2.0			24	C	

FIELD MAINTENANCE

Table 1. MAC for Heavy Equipment Transporter (HET) Semitrailer. - Cont.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE	
			FIELD		SUSTAINMENT				
			CREW	MAIN- TAINER	BELOW DEPOT	DEPOT			
			C	F	H	D			
1501	Hydraulic Control Module Frame	REPLACE	0.1	3.0			5, 10, 22, 24	A, C	
1501	Gooseneck Steps	REPLACE		0.6			24		
1501	Gooseneck Guardrails	REPLACE		0.3			24		
1501	Grab Handles	REPLACE		0.3			24		
1501	Platform Steps and Service Covers	REPLACE		0.6			24		
1503	Gooseneck Pivot	SERVICE					5	C	
		SERVICE		0.3			5	C	
1503	Gooseneck Hydraulic Cylinder, Attaching Hardware	REPLACE		2.0			5,7,11,20,21 24,25	C	
1503	Pivot Pin Gooseneck	REPLACE		2.0			3,5,10,19,22,24	C	
		REPAIR		0.5			3,5,10,19,22,24	C	
1507	Front Support Legs	REPAIR		2.5			5, 24	C	
1507	Pivot Pin Sheave Gooseneck	REPLACE		2.0			5, 24	C	
		REPAIR		0.5			5, 24	C	
1507	Spare Wheel Carrier	REPLACE		0.9			5, 24	C	
1507	Rear Support Legs	REPAIR		2.0			5, 24	C	
18	BODY, CAB, HOOD, AND HULL								
1801	Splash Guards	REPLACE			0.3			24	
1801	Control Module	REPLACE			0.5			24	
	Frame Covers								
1801	Front Clearance								
	Light Bracket (Some Trailers)	REPLACE		0.5			24		
1802	Deflectors	REPLACE		0.5			24		
1808	Stowage Compartment	REPLACE		1.0			5, 24	C	
		REPAIR		0.3			5, 24	C	
20	HOIST, WINCH, CAPSTAN, WINDLASS, POWER CONTROL UNIT, AND POWER TAKE OFF								
2001	Davit Assembly	SERVICE	0.1	0.1			5, 24	C	
		REPLACE		0.1			5, 24	C	
		REPAIR		1.0			5, 24	C	
2007	Snatch Block Assembly	SERVICE					5, 24	C	
		REPLACE		0.2			5, 24	C	
		REPAIR		1.7			5	C	
2007	Cable Guide Assembly	REPLACE		0.3			5, 24	C	
		REPAIR		0.5			5, 24	C	
22	BODY, CHASSIS, AND HULL ACCESSORY ITEMS								
2202	Reflectors	REPLACE			0.1			24	C
2210	Data Plates and Stencils	REPLACE		4.0			5, 24	C	
24	HYDRAULIC LIFT COMPONENTS								
2401	Hydraulic Pump	REPLACE		0.3			5	C	
2402	4-Way Directional	REPLACE		0.4			5, 23, 24	C	
	Control Valve Bank	REPAIR		1.5			5, 23, 24	C	
2402	Steering Control	REPLACE		0.8			5, 24	C	
	Manifold	REPAIR		1.2			5, 24	C	

FIELD MAINTENANCE

Table 1. MAC for Heavy Equipment Transporter (HET) Semitrailer. - Cont.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAIN- TAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
2402	Suspension Control	REPLACE		0.5			5, 24	C
	Manifold	REPAIR		1.0			5, 24	C
2402	Line Fracture Valve	REPLACE		0.5			24	
2403	Valve Handles	REPLACE		0.3			24	
2403	Suspension Isolation	REPLACE		0.6			24	
	Valve Assembly							
2403	Suspension Shutoff	REPLACE		1.5			5, 24	C
	Valve Assembly							
2403	Gooseneck Isolation	REPLACE		1.5			5, 24	C
	Valve Assembly	REPAIR		1.0			5, 24	C
2406	Gooseneck Hydraulics	SERVICE		0.3			5, 24	C
		REPLACE		1.5			5, 24	C
2406	APU Hydraulics	SERVICE		0.6			5, 24	C
		REPLACE		1.0			5, 24	C
2406	Step Hydraulics	REPLACE		0.4			5, 24	C
2406	Hydraulic Filter	REPLACE		0.5			5, 24	C
2406	Hydraulic Pressure Gauges	REPLACE		0.5			5, 24	C
2406	Gooseneck Cylinder	REPLACE		0.5			5, 24	C
	Hydraulics							
2406	Hydraulic Tank Filter	SERVICE		0.5			5, 24	C
		REPLACE		0.5			5, 24	C
2406	Platform Suspension	SERVICE		3.0			5, 24	C
	Hydraulics	REPLACE		4.0			5, 24	C
2406	Platform Steering Hydraulics	SERVICE		1.0			5, 24	
		REPLACE		4.0			5, 24	
2407	Suspension	REPLACE		2.5			5,13,16,23,24	C
	Hydraulic Cylinder	REPAIR			2.0		3,5,6,14,24	C
2407	Gooseneck	REPLACE		2.0			1,5,23,24	C
	Hydraulic Cylinder	REPAIR			2.0		3, 5, 24	C
2408	Hydraulic Tank Assembly	REPLACE		1.0			5, 8	C
		REPAIR		0.5			5, 8	C
2408	Gooseneck Cylinder	REPLACE		0.5			5, 24	C
	Air Reservoir							
29	AUXILIARY GENERATOR							
	AND ENGINE CONTROL							
2901	APU Engine	SERVICE		0.5			24	
		REPLACE		1.0			24	
2911	Engine Block and	REPAIR		0.3			5, 24	C
	Cylinder Head							
2911	Glow Plug	REPLACE		0.1			24	
2911	Drain Cock	REPLACE		0.2			24	
2913	Flywheel	REPLACE		2.0			5, 24	C
2915	Transmission Cover	REPLACE		0.5			5, 24	C
2916	Oil Filter and Dipstick Switch	REPLACE		0.2			5, 24	C
2916	Oil Pressure Switch	REPLACE		0.3			5, 24	C
2922	Nozzle Holder Assembly	REPLACE		0.4			5, 24	C
2932	Injection Pump	ADJUST		0.3			2, 5, 24	C
		REPLACE		0.5			2, 5, 24	C
2933	Air Cleaner Assembly	SERVICE		0.2			5, 24	C
		REPLACE		0.4			5, 24	C

FIELD MAINTENANCE

Table 1. MAC for Heavy Equipment Transporter (HET) Semitrailer. - Cont.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAIN-TAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
2935	Fuel Tank Assembly	SERVICE	0.1				5, 24	C
		SERVICE		0.1			5, 24	C
		REPLACE		0.5			5, 24	C
		REPAIR		0.3			5, 24	C
2937	Fuel Filter Assembly	REPLACE		0.3			5, 24	C
		REPAIR		0.3			5, 24	C
2938	Engine Priming System	REPLACE		0.5			5, 24	C
2939	Mechanical Throttle Control	REPLACE		0.2			24	
2939	APU Control Box	REPLACE		0.5			24	
2941	Engine Exhaust	REPLACE		0.4			5, 24	C
2951	Engine Radiator	SERVICE		0.2			5, 24	C
		REPLACE		0.5			5, 24	C
2955	Fan Belt	REPLACE		0.6			24	
2955	Fan Vane Axial	REPLACE		0.4			24	
2963	Starter	REPLACE		0.3			24	
2963	Jump Start System	REPLACE		1.2			5, 24	C
3100	On-Vehicle Equipment	REPLACE	0.1				3	

Table 2. Tools And Test Equipment Requirements For Heavy Equipment Transporter (HET) Semitrailer.

TOOLS OR TEST EQUIPMENT	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER	TOOL NUMBER
1	F	Handle, Ext, SPNSN ISOL Valve	5340-01-386-2114	-
2	F	Shop Equip, Gen Purpose Repair	4940-00-287-4894	-
3	F	Socket, Suspension Brg Nut	5120-01-358-3054	-
4	F	Wrench, Spanner	5120-01-358-3085	-
5	F	Mandrel, Suspension	2530-01-355-3091	-
6	F	Suspension Stop Ring Tool	5120-01-358-3120	-
7	F	Chain Assy, 5/16" LK, 46 in L	4010-01-386-1008	SW34206
8	F	Chain Assy, 5/16" LK, 11 FT L	4010-01-361-7267	-
9	F	Hone, Cylinder 2" - 7" Port	5130-00-991-0699	-
10	F	Tool Kit, Field Maint, Basic	4910-00-754-0705	-
11	F	Tool Kit, General Mechanics	5180-00-177-7033	-
12	F	Tool Kit, Com #1	4910-00-754-0654	-
13	F	Tool Kit, Com #2	4910-00-754-0650	-
14	F	ArcWelder	3431-01-032-6289	-
15	F	Fire Extinguisher	4210-00-202-7856	-
16	F	Welder Helmet	4240-00-540-0623	-
17	F	Apron, Leather	9415-00-234-9254	-
18	F	Crank, Hand APU	5340-01-321-0542	-
19	F	Kit, Ultra Bushing Rem/Instl	2530-01-381-9847	-
20	F	Kit, Axle Rem/Instl	2530-01-381-9902	SW33968
21	F	Kit, SPNSN Cyl Removal	5120-01-383-6487	-
22	F	Spanner, Adjustable Hook	5120-00-277-9076	-
23	F	Spanner, Face Pin	5120-00-264-3777	-
24	F	Ram, Hyd, 50 Ton Portable	4320-00-810-6776	4122
25	F	Lifting Strap	---	EE2801
26	F	Truck,Wrecker M984	2320--01-097-0248	-
27	F	Ram, Hyd, 30 Ton Portable	4320--00-542-3189	-
28	F	Standard Army Tool Set	---	-
29	F	Davit	2950--01-326-5324	SW28806
30	F	Chain Assy, 1/2 11L	4010--01-371-5572	-
31	F	Metallic Tube, 36"L	4710--01-360-4273	SW26621

Table 3. Section IV, Remarks for Heavy Equipment Transporter (HET) Semitrailer.

REMARK CODE	REMARKS
A	TOOL MUST BE MANUFACTURED IN ACCORDANCE WITH WP 0145 PRIOR TO STARTING.
B	AIRBORNE AND GAUGE ARE AVAILABLE IN THE M1070 TRACTOR WP 0150. USE SATS IF AVAILABLE OR USE COM TOOL KIT NUM 1 (NSN 4910-00-754-00654, PN W32593)
C	AND/OR COM TOOL KIT NUM 2 (NSN 4910-00-754-00650, PN W32730).
D	REFER TO LUBRICATION INSTRUCTIONS (WP 0163).

COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS

INTRODUCTION**Scope**

This work package lists COEI and BII for the Heavy Equipment Trailer (HET) to help you inventory items for safe and efficient operation of the equipment.

GENERAL

The COEI and BII information is divided into the following lists:

Components of End Item (COEI). This list is for information purposes only and is not authority to requisition replacements. These items are part of the HET. As part of the end item, these items must be with the end item issued or transferred between property accounts. Items of COEI are removed and separately packaged for transportation or shipment only when necessary. Illustrations are furnished to help you find and identify the items.

Basic Issue Items (BII). These essential items are required to place the HET in operation, operate it, and to do emergency repairs. Although shipped separately packaged, BII must be with the HET during operation and when it is transferred between property accounts. Listing these items is your authority to request/requisition them for replacement based on authorization of the end item by the TOE/MTOE. Illustrations are furnished to help you find and identify the items.

EXPLANATION OF COLUMNS

Column (1) - Item No. This column indicates the item number.

Column (2) - National Stock Number and Illustration. Indicates the national stock number assigned to the end item and will be used for requisitioning purposes and contains an illustration of the item.

Column (3) Description, Part Number/(CAGEC). Identifies the federal item name (in all capital letters) followed by a minimum description when needed. The last line below the description is the Contractor and Government Entity Code (CAGEC) (in parentheses) followed by the part number.

Column (4) Usable On Code. When applicable, gives you a code if the item you need is not the same for different models of equipment. Usable on code is not used for the M1000 semitrailer.

Column (5) U/I (Unit of Issue). Indicates how the item is issued for the NSN in column 2. Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr).

Column (6) Qty Rqd. Indicates the quantity required. Indicates the quantity of the item authorized to be used with/on the equipment.

Table 1. BII Item List.


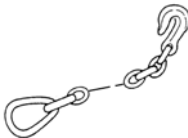


(1) Item No.	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr
1	NSN 3990-01-440-5975 	Binder, Load 1/2-in. LK, (payload tiedown), 61208 SW33304 (OV272)	HET	EA	4
2	NSN 4010-01-361-8378 	Chain Assembly, 1/2-in. LK, FT L (Payload Tiedown), 1900-03410 SW33303-1 (ONXJ2)	HET	EA	2
3	NSN 4010-01-371-5772 	Chain Assembly, 1/2-in. LK, 11 FL (Payload Tiedown), 1900-03430 SW33303-2 (ONXJ2)	HET	EA	2
4	1. NSN 4010-01-385-5974 2. NSN 3990-00-401-1503 3. NSN * 4. NSN * 	1. Chain Assembly, 1/2-in. LK, 19 FT L (Payload Tiedown), 1900-03450 SW33303-3 (ONXJ2) 2. Binder, Load, 3/4-in. LK, (Payload Tiedown), 4178A (84081) 3. Chain Assembly, 3/4-in. LK, 11 FT L (Payload Tiedown), SW31952-1 4. Chain Assembly, 3/4-in. LK, 11 FT L (Payload Tiedown), SW31952-2	HET	EA	2 4 4 2

Table 1. BII Item List. – Continued.

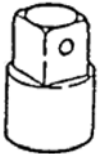



(1) Item No.	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr
5	NSN 5120-00-144-5207 	Adapter, Socket Wrench, 1/2-in. DR to 3/4-in. DR, B107.10M (80204)	HET	EA	1
6	NSN 4710-01-360-4273 	Tube, Metallic, 36-in. L, SW26621 (98255)	HET	EA	1
7	NSN 5120-00-293-0665 	Bar, Wrecking, 30-in. L55-130 (57068)	HET	EA	1
8	NSN 3990-01-360-9669 	Binder, Load, 5/16-in. LK (Chock EA 2 Tiedown), 01201, (OV272)	HET	EA	2

Table 1. BII Item List. – Continued.




(1) Item No.	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr
9	NSN 4010-01-361-7267 	Chain Assembly, 5/16-in. LK, 11 ft L (Chock Tiedown), SW30512-2 (98255)	HET	EA	4
10	NSN 4010-01-386-1008 	Chain Assembly, Tire Changing, EA 1 5/16-in. LK, 46-in. L SW34206 (98255)	HET	EA	1
11	NSN 4010-01-361-8379 	Chain Assembly, Axle Isolation, Transporting, SW34205 (98255)	HET	EA	1

Table 1. BII Item List. – Continued.


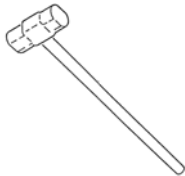
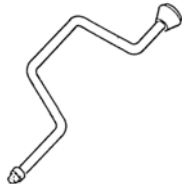

(1) Item No.	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr
12	NSN 5120-00-227-8079 	Extension, 3/4-in. DR, 8-in. L, L122 (C7127)	HET	EA	1
13	NSN 5120-00-293-0887 	Hammer, Hand, 12 lb, FAC 1038 (34871)	HET	EA	1
14	NSN 5120-00-104-1736 	Handle, Socket Wrench, 1/2-in. DR, SN4A (55719)	HET	EA	1
15	NSN 5120-00-249-1076 	Handle, Socket Wrench, 3/4-in. DR, 1940708 (80064)	HET	EA	1

Table 1. BII Item List. – Continued.

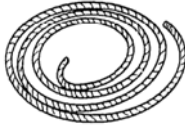



(1) Item No.	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr
16	NSN 4020-00-477-3734 	Rope, Fibrous 1/2-in., 75 ft L, CPR102915 (19207)	HET	EA	1
17	NSN 5120-00-222-8852 	Screwdriver, Flat Tip, 225498 (77948)	HET	EA	1
18	NSN 4030-00-533-3900 	Shackle (Payload Tiedown), 8387707-1 or M655 (19207) or (90202)	HET	EA	4
19	NSN 4030-00-169-9297 	Shackle, Towing, M666A (90202)	HET	EA	4

Table 1. BII Item List. – Continued.


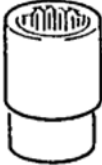



(1) Item No.	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr
20	NSN 5120-00-189-7932 	Socket; Socket Wrench 9/16-in., 1/2-in. DR, 11677025-1 (19207)	HET	EA	1
21	NSN 5120-00-239-0021 	Socket; Socket Wrench 1-1/8-in., 3/4-in. DR, 1818 (60043)	HET	EA	1
22	NSN 5120-00-199-7765 	Socket; Socket Wrench 1-5/8-in. 3/4-in. DR, 5552 (93389)	HET	EA	1
23	NSN 5120-00-199-7769 	Socket; Socket Wrench 1-7/8-in. 3/4-in. DR, 050442 (65814)	HET	EA	1
24	NSN 5130-01-389-8450 	Socket, 1-1/2-in. HEX x 13/16-in. Square EA 1 Nut, 3/4-in. DR, BWD 482 SW31873 (55719)	HET	EA	1

Table 1. BII Item List. – Continued.


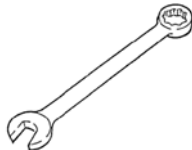
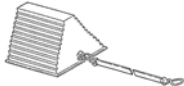
(1) Item No.	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr
25	NSN 5120-00-449-8083 	Wrench, Open End, Adjustable, 10-in., 5385A14 (15073)	HET	EA	1
26	NSN 5120-01-300-1363 	Wrench, Combination, 15-Degree Offset, 13/16-in. GOEX26 (55719)	HET	EA	1
27	NSN 2540-01-324-9404 	Chock, Wheel-Track (Located Streetside/Curb side of Gooseneck) SW34369 (98255)	HET	EA	4

Table 1. BII Item List. – Continued.


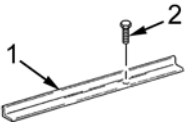
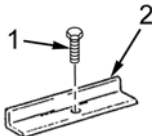
(1) Item No.	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr
28	NSN 2540-00-490-0769 	Block, Chock (Curb-guide) (Secured in Center Recess of Platform), CPR101269 (19207)	HET	EA	12
29	1. NSN 5340-01-332-7379 2. NSN 5305-00-990-8382 	1. Angle Bracket (Curb-guide Retainer), SW30912 (98255) 2. Screw, Cap, HEX HD, (Bracket Mounting), B1821BH100C275N (80204)	HET	EA	2 3
30	1. NSN 5305-00-990-8382 2. NSN 5340-01-385-9887 	1. Screw, Cap, HEX HD (Bracket Mounting), B1821BH100C275N (80204) 2. Bracket, Angle (Curb-guide Retainer), SW30912-1 (98255)	HET	EA	3 1

Table 1 BII Item List – Continued

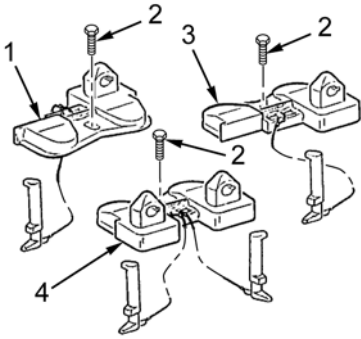
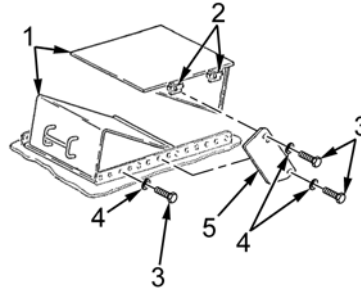
(1) Item No.	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr
31	1. NSN 5340-01-440-2222 2. NSN 5340-01-472-5712 3. NSN 5340-01-440-2221 4. NSN 5305-00-990-8382 	1. Bracket, Locking, Curb (Secured in Center Recess of Platform), SW34446-2 (98255) 2. Bracket, Locking, Street (Secured in Center Recess of Platform), SW34446-3 (98255) 3. Bracket, Locking, Center (Secured in Center Recess of Platform), SW34446-1 (98255) 4. Screw, Cap, HEX HD (Bracket Mounting), B1821BH100C275N (80204)	HET	EA	2 2 4 8
32	1. NSN 2540-01-324-9403 2. NSN 5340-01-346-8064 3. NSN 5310-01-448-1089 4. NSN 5310-00-080-6004 5. NSN 5305-00-543-2419 	1. Chock, Wheel-Track (Payload) (Stowed on Front Corners of Platform) SW34394, (98255) 2. Plate, Mounting (Chock Mounting), SW30241, (98255) 3. Nut, Clip-on, C30664-3816- 3B (72800) 4. Washer, Flat (Chock Mounting), MS27183-14 (96906) 5. Screw, Cap, HEX HD (Chock Mounting), B1821BH038C113N (80204)	HET	EA	4 4 16 10 10

Table 1. BII Item List. – Continued.


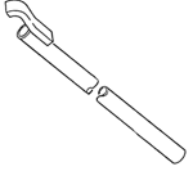
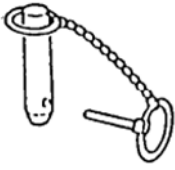
(1) Item No.	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr
33	NSN 5120-00-224-1390 	Crowbar, 60-in. L (Stowed on Rear Platform under Ramps), 9150189, Alter per WP 0145 (18876)	HET	EA	1
34	NSN 5340-01-386-2114 	Handle, Extension, Suspension Isol Valve (Stowed on Rear of Platform under Ramps), SW32948 (98255)	HET	EA	1
35	NSN 5315-01-301-3888 	Pin, Straight, Headed (Crowbar Stowage), 13228E2053 (97403)	HET	EA	1

Table 1. BII Item List. – Continued.



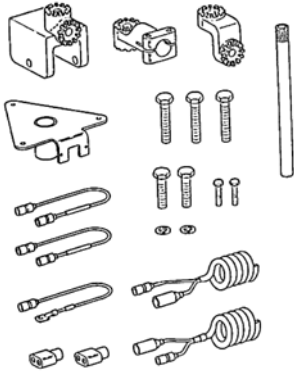
(1) Item No.	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr
36	NSN 5365-01-154-8557 	Ring, Retaining (Crowbar Stowage), 29-10 (96652)	HET	EA	1
37	NSN 6220-01-442-2652 	Light Assembly, Strobe, 12V, 200SGT (82485)	HET	EA	1

Table 1. BII Item List. – Continued.

(1) Item No.	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr
38	NSN 2590-01-107-9696 	Kit, Warning Light, 12296622 (19207) 1. Washer, Lock (2), P/N MS35338-48 2. Pipe, P/N 12296639-1 (saw 2 1/2 in. off one end) 3. Clamp, P/N 12296644 4. Bolt (3), P/N 12296638 5. Pole Mount Bracket, P/N 12296643 6. Bolt (2), P/N MS90726-115 7. L-Bracket, P/N 12296641 8. Bolt (2), P/N MS90726-38 9. Plate, Triangle, P/N 12296642 10. Cable Assembly, ground, P/N 12296578-1 11. Lead (2), P/N 8762797 12. Adapter (2), P/N MS27147-1 13. Cable Assembly, P/N 12296577 Remaining parts in kit are not used.	HET	EA	1

END OF WORK PACKAGE

FIELD MAINTENANCE
EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

SCOPE

This work package lists expendable and durable items that you will need to operate and maintain the Heavy Equipment Transporter (HET) semitrailer. This list is for information only; it does not provide authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (Except Medical, Class V Repair Parts, and Heraldic Items), CTA 50-909, Field and Garrison Furnishings and Equipment, or CTA 8-100, Army Medical Department Expendable/Durable Items.

EXPLANATION OF COLUMNS

Column (1) - Item No. This number is assigned to the entry in the list and is referenced in the narrative instructions to identify the Item (e.g., Use brake fluid [WP 0098, Item 5]).

Column (2) - Level. This column identifies the lowest level of maintenance that requires the listed Item:

C = Crew

F = Maintainer, AMC, or ASB

H = Below Depot or TASMG

D = Depot

Column (3) - National Stock Number (NSN). This is the NSN assigned to the Item. Use the NSN to requisition the item.

Column (4) - Item Name, Description, Part Number/(CAGEC). This column provides the other information you need to identify the Item. The last line below the description is the part number and the Commercial and Government Entity Code (CAGEC) (in parentheses).

Column (5) - U/I. Unit of Issue (U/I) code. Shows the physical measurement or count of an Item, such as gallon, dozen, gross, etc.

Table 1. Expendable and Durable Items List.

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGEC, AND PART NUMBER	(5) U/I
1	F	6810-00-286-5435	Alcohol Technical, (81348) TT-I-735 GRADE A	gl
2	F	6850-00-181-7933	Antifreeze Glycol, Inhibited (81349) MIL-A-46153	gl
3	F	7920-00-061-0037	Brush Scrub (80244) A-A-2074	ea
4	F	5340-00-450-5718	Cap and Plug Set (19207) 10935405	kt
5	F	2940-01-415-5891	Cleaner, Surface (02731) TT-C-490	qt
6	F	5350-00-221-0872	Crocus Cloth, Abrasive (80204) ANSI B74.18	pg
7	F	8030-00-165-8577	Coating Compound, Metal Pretreatment (81349) DOD-P-15328	gl
8	F	8010-01-055-2319	Coating, Polyurethane (81349) MIL-C-46168	kt
9	F	8010-01-229-7540	Coating, Polyurethane (81349) MIL-C-53039	qt
10	F	8030-00-221-1835	Corrosion Preventive Compound, Cold Application (81349) MIL-C-83933	gl
11	F	7930-00-249-8036	Detergent, General Purpose (81348) P-D-220	bx
12	F	8010-00-264-8866	Epoxy Primer Coating Kit (81349) MIL-P-53030	kt
13	C	9140-00-286-5283	Fuel, Oil Diesel, DFA, Arctic Grade (81348) VV-F-800, GRADED FAAR	gl
14	C	9140-00-286-5286	Fuel, Oil Diesel, DF1, Winter Grade (81346) VV-F-800, ASTMD975	gl
15	C	9140-00-286-5294	Fuel, Oil Diesel, DF2, Regular Grade (81346) VV-F-800, ASTMD975	gl
16	C	9150-00-190-0905	Grease Automotive and Artillery (81349) M-10924-A	cn
17	F	9150-00-111-6254	Hydraulic Fluid Rust Inhibited Fire Resistant Synthetic, Hydrocarbon Base (81349) MIL-H-46170	gl

Table 1. Expendable and Durable Items List.- Continued.

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGEC, AND PART NUMBER	(5) U/I
18	F	9150-01-954-7422	Lubricant Solid Film, Air Cured, Corrosion Inhibiting, Type II (81349) MIL-L-23398	cn
19	F	2640-00-256-5526	Lubricant Tire and Rim, Quart Can (96980) AA17	qt
20	C	9150-00-186-6699	Oil, Lubricating SAE 10W-30 (81349) MIL-L-46152	qt
21	F	9150-00-250-0926	Petroleum Jelly (82146) 14P1	lb
22	F	5330-01-188-0919	Pipe Sealant (61078) LH050	tu
23	C	7920-00-205-3571	Rag Wiping, Cotton, and Cotton Synthetic (81348) DDD-R-0030, Grade B	bx
24	F	8040-00-833-9563	Sealant Adhesive, Silicone RTV, Type I (81349) MIL-A-46106	tu
25	F	8030-00-148-9833	Sealing Compound Thread Locking, Type II, Grade N (05972) 27121	qt
26	F	5970-01-142-2282	Sleeving, Electrical Insulation, Shrinkable (81343) M23053/4-303-0	in
27	F	5970-0-812-2969	Sleeving, Electrical Insulation, Shrinkable (81343) M23053/5-104-0	in
28	F	5970-00-954-162	Sleeving, Electrical Insulation, Shrinkable (81343) M23053/5-105-0	in
29	F	6810-00-264-6618	Sodium Bicarbonate, Technical (Baking Soda) (58536) AA374-2	lb
30	F	3439-01-153-2077	Solder Tin-Lead Alloy, Type R, SN60 (81346) QQ-S-571	lb
31	F	6850-00-209-7947	Solvent, Cleaning Compound (81348) O-C-1889	dr
32	F	6850-01-474-2320	Solvent, Dry Cleaning (58536) AA59603-3F	5 gl
33	F	5975-00-903-2284	Strap, Tiedown, Electrical (96906) MS3367-4-0	bg
34	F	7510-01-308-0549	Tape, Double-Sided (52152) 4930	rl
35	F	5970-00-644-2636	Tape, Insulation, Electrical, Pressure Sensitive Adhesive, 0.75-in. wide, Black (81348) HH-I-595-B-66-0	rl
36	F	7510-00-266-6709	Tape, Pressure Sensitive, Adhesive, Masking, Type I (76381) 232 1-1/2 in.	rl
37	F	3610-01-085-2357	Tape, Teflon, 0.250-in. wide (83616)	rl
38	F	6810-00-297-9540	Water, Battery (81348) O-B-41	gl
39	F	6680-00-853-2714	Housing Assembly, Welding (89305) 463635	cn

END OF WORK PACKAGE

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RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is ODISC4.						Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).		DATE Date you filled out this form.	
TO: (Forward to proponent of publication or form) (Include ZIP Code) U.S. Army TACOM Life Cycle Management Command ATTN: AMSTA-LCL-MPP/TECH PUBS 1 Rock Island Arsenal, Rock Island, IL 61299-7630						FROM: (Activity and location) (Include ZIP Code) Your mailing address			
PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS									
PUBLICATION/FORM NUMBER TM 9-2330-381-13						DATE 30 Oct 09		Title Heavy Equipment Transporter (HET) Semitrailer	
ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Provide exact wording of recommended changes, if possible).			
	0004-1					Callouts on art are numbered incorrectly Callouts 3, 4, and 5 should be 6, 7, and 8 <div style="text-align: center; font-size: 100px; transform: rotate(-10deg); opacity: 0.5;"> SAMPLE </div>			
<i>*Reference to line numbers within the paragraph or subparagraph.</i>									
TYPED NAME, GRADE OR TITLE Your Name					TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION			Signature Your Signature	

TO: (Forward direct to addressee listed in publication) U. S. Army TACOM Life Cycle Management Command ATTN: AMSTA-LCL-MPP/TECH PUBS 1 Rock Island Arsenal, Rock Island, IL 61299-7630				FROM: (Activity and location) (Include ZIP Code) Your address				DATE Date you filled out this form	
PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS									
PUBLICATION NUMBER TM 9-2330-381-13				DATE 30 Oct 09			TITLE Heavy Equipment Transporter (HET) Semitrailer		
PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION	
<div style="font-size: 100px; opacity: 0.5;">SAMPLE</div>									
PART III – REMARKS (Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)									
TYPED NAME, GRADE OR TITLE Your Name			TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION				SIGNATURE Your Signature		

TO: (Forward direct to addressee listed in publication) U. S. Army TACOM Life Cycle Management Command ATTN: AMSTA-LCL-MPP/TECH PUBS 1 Rock Island Arsenal, Rock Island, IL 61299-7630					FROM: (Activity and location) (Include ZIP Code)			DATE	
PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS									
PUBLICATION NUMBER TM 9-2330-381-13					DATE 30 Oct 09			TITLE Heavy Equipment Transporter (HET) Semitrailer	
PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION	
PART III – REMARKS (Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)									
TYPED NAME, GRADE OR TITLE				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION			SIGNATURE		

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is ODISC4.						Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: (Forward to proponent of publication or form) (Include ZIP Code) U. S. Army TACOM Life Cycle Management Command ATTN: AMSTA-LCL-MPP/TECH PUBS 1 Rock Island Arsenal, Rock Island, IL 61299-7630						FROM: (Activity and location) (Include ZIP Code)	
PUBLICATION/FORM NUMBER TM 9-2330-381-13						DATE 30 Oct 09	TITLE Heavy Equipment Transporter (HET) Semitrailer
ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Provide exact wording of recommended changes, if possible).	
<i>*Reference to line numbers within the paragraph or subparagraph.</i>							
TYPED NAME, GRADE OR TITLE					TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION		SIGNATURE

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TYPED NAME, GRADE OR TITLE				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION			SIGNATURE		

By Order of the Secretary of the Army:

Official:

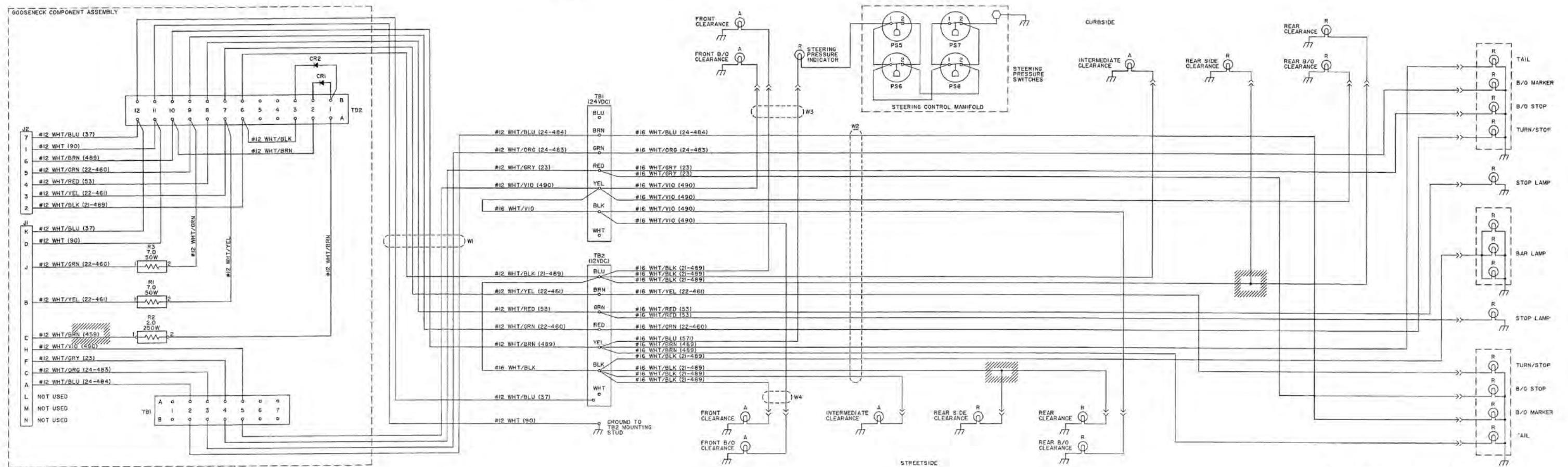
A handwritten signature in black ink, appearing to read "Joyce E. Morrow". The signature is fluid and cursive, with the first name "Joyce" being more prominent.

JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army
0913406

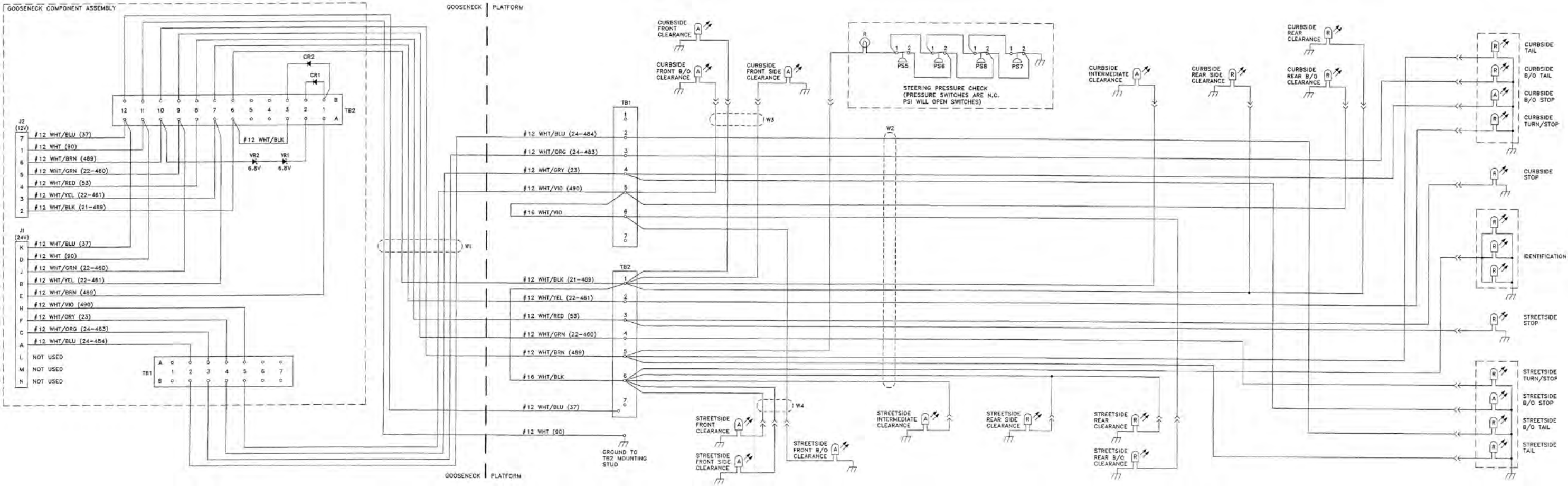
GEORGE W. CASEY, JR.
General, United States Army
Chief of Staff

Distribution:

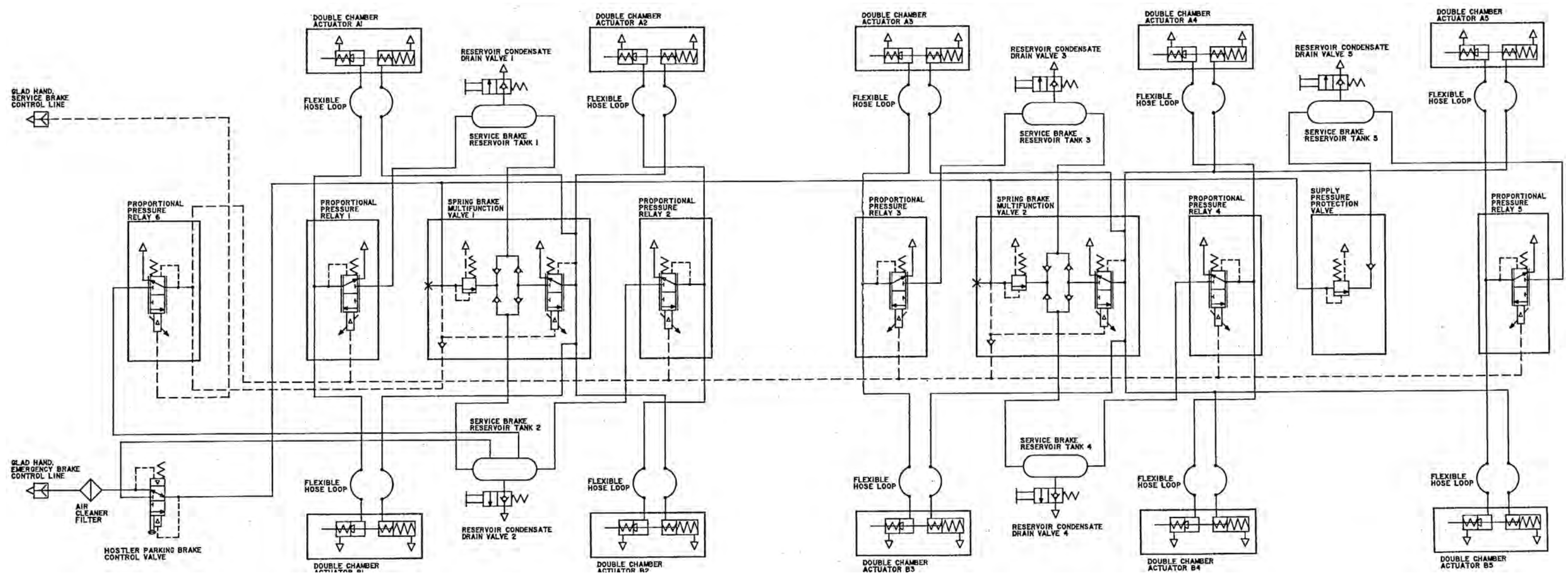
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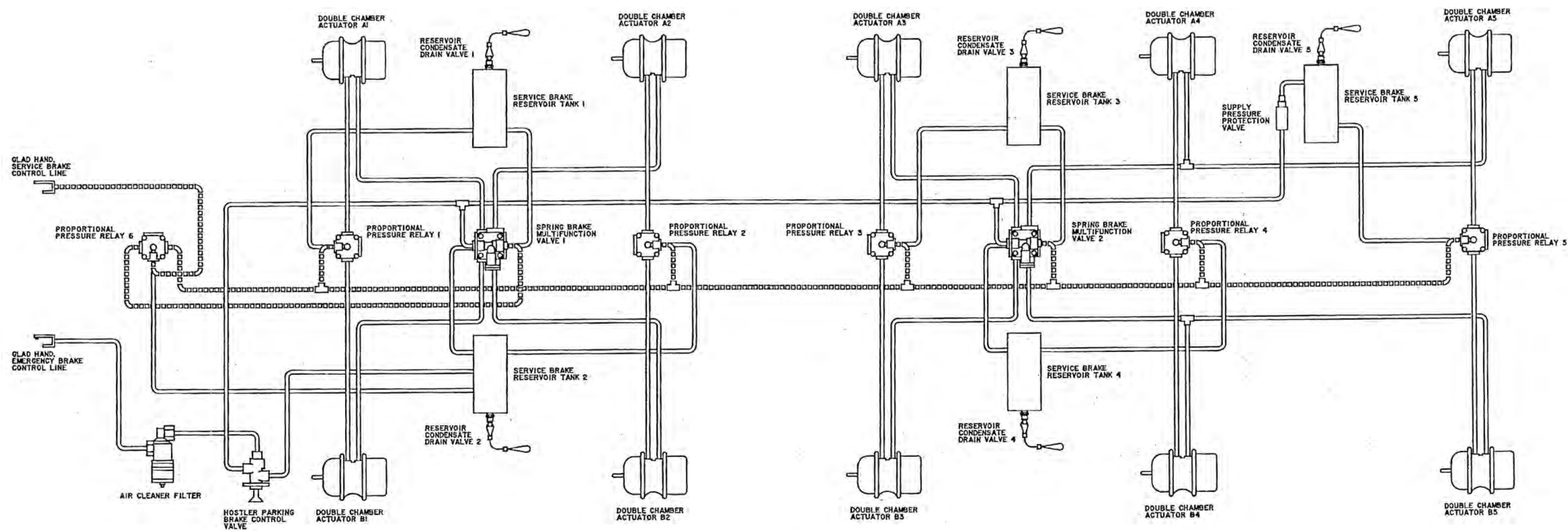


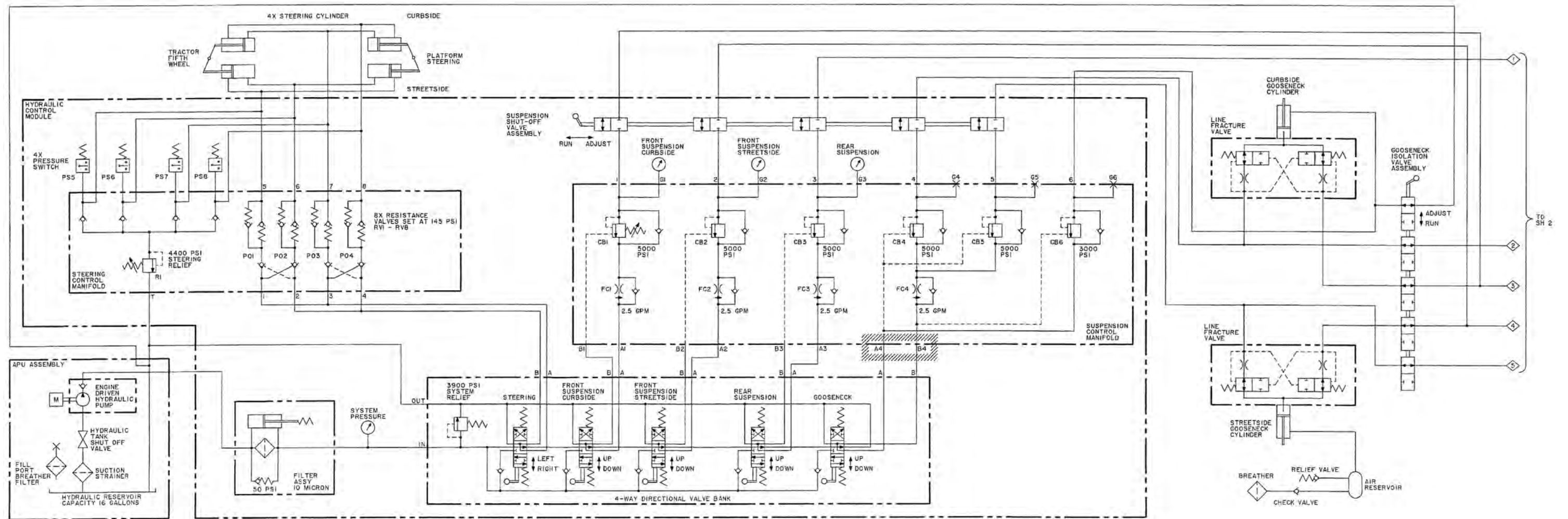
FO-1. Semitrailer Electrical Schematic.
FP-1/(FP-2 blank)



FO-2. Semitrailer
Electrical Schematic (LED).
FP-3/(FP-4 blank)



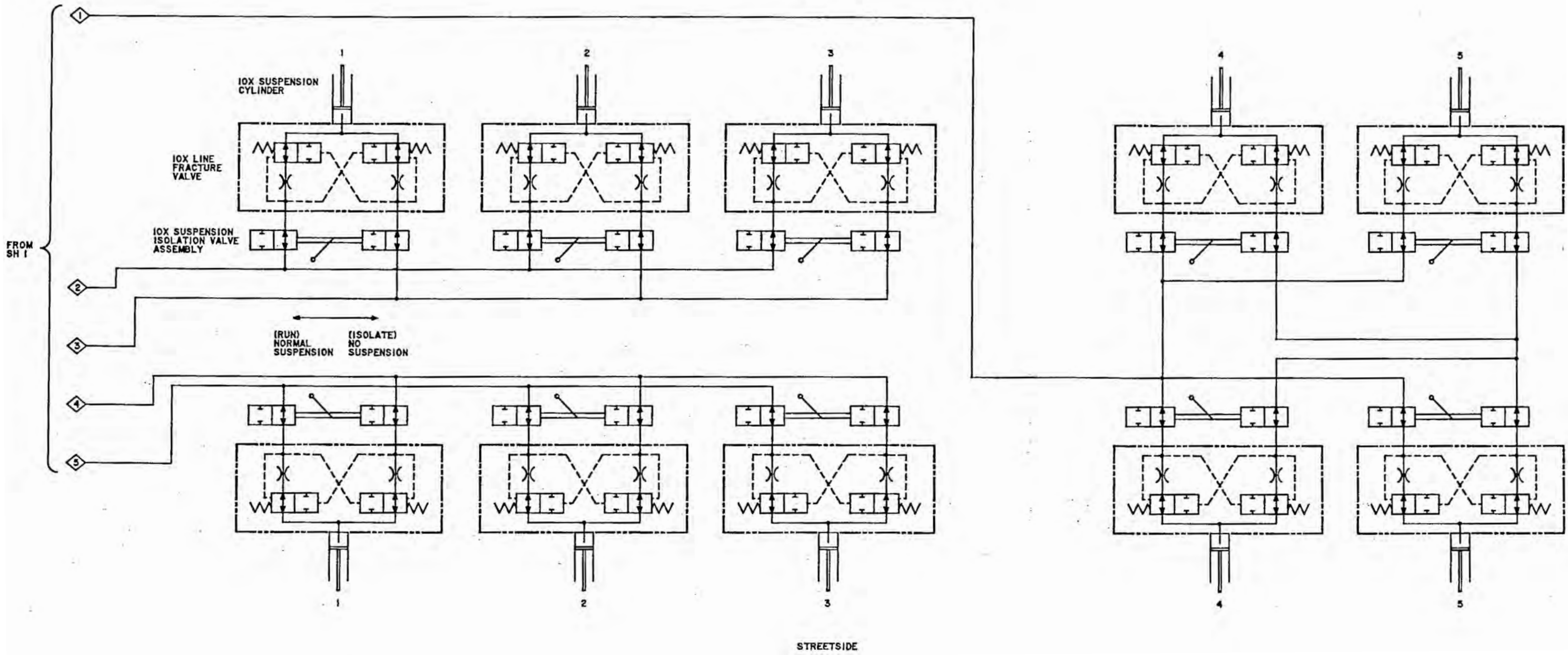


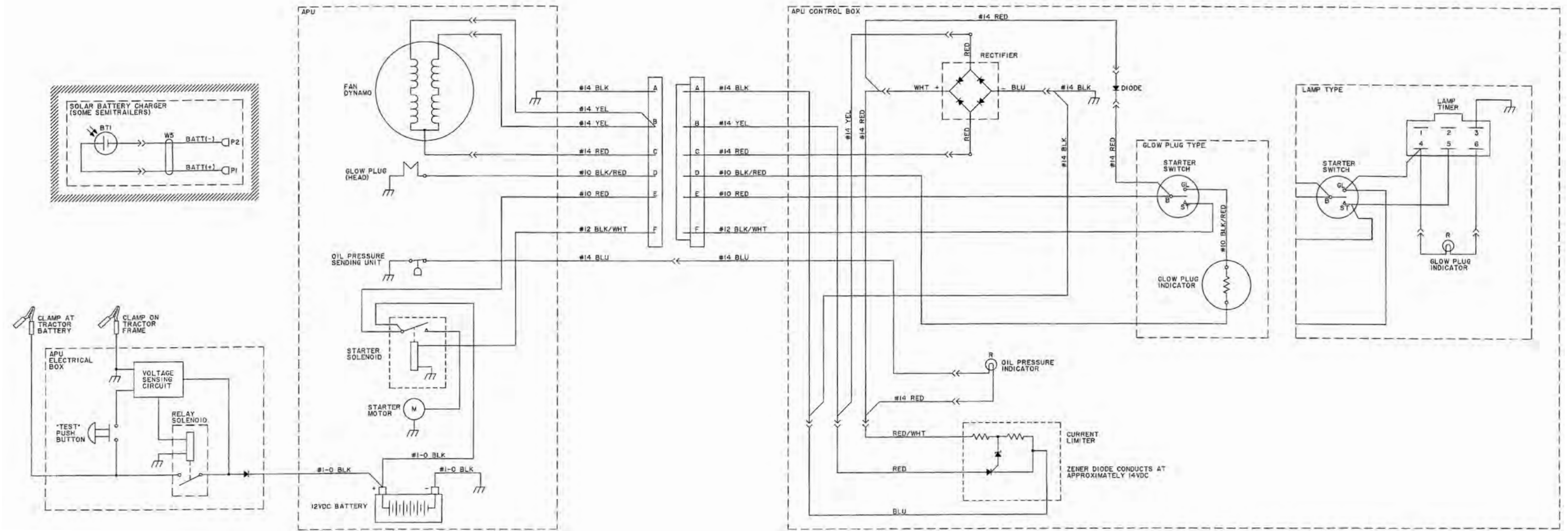


FO-5. Semitrailer Hydraulic Schematic (Sheet 1 of 2).
FP-9/(FP-10 blank)

CURBSIDE

STREETSIDE





FO-7. APU Electrical Schematic.
FP-13/(FP-14 blank)

THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeter = 0.01 Meters = 0.3937 inches
 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 inches
 1 Kilometer = 1000 Meters = 0.621 Miles

SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeter = 0.155 Sq. Inches
 1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Inches
 1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
 1 Kilogram = 100 Grams = 2.2 lb. 1 Cu. Meter = 1,000,000
 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches
 1 Cu. Centimeters = 35.31 Cu. Feet

LIQUID MEASURE

1 Millimeter = 0.001 Liters = 0.0338 Fluid Ounces
 1 Liter = 1000 Millimeters = 32.82 Fluid Ounces

TEMPERATURE

$5/9 (^{\circ}\text{F} - 32) = ^{\circ}\text{C}$
 212° Fahrenheit is equivalent to 100° Celsius
 90° Fahrenheit is equivalent to 32.2° Celsius
 32° Fahrenheit is equivalent to 0° Celsius
 $9/5 ^{\circ}\text{C} + 32 = ^{\circ}\text{F}$

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches.....	Centimeters.....	2.540
Feet.....	Meters.....	0.305
Yards.....	Meters.....	0.914
Miles.....	Kilometers.....	1.609
Square Inches.....	Square Centimeters.....	6.451
Square Feet.....	Square Meters.....	0.093
Square Yards.....	Square Meters.....	0.836
Square Miles.....	Square Kilometers.....	2.590
Acres.....	Square Hectometers.....	0.405
Cubic Feet.....	Cubic Meters.....	0.028
Cubic Yards.....	Cubic Meters.....	0.765
Fluid Ounces.....	Milliliters.....	29.573
Pints.....	Liters.....	0.473
Quarts.....	Liters.....	0.946
Gallons.....	Liters.....	3.785
Ounces.....	Grams.....	28.349
Pounds.....	Kilograms.....	0.454
Short Tons.....	Metric Tons.....	0.907
Pound-Feet.....	Newton-Meters.....	1.356
Pounds per Square Inch.....	Kilo pascals.....	6.895
Miles per Gallon.....	Kilometers per Liter.....	0.425
Miles per Hour.....	Kilometers per Hour.....	1.609

TO CHANGE	TO	DIVIDE BY
Centimeters.....	Inches.....	2.540
Meters.....	Feet.....	0.305
Meters.....	Yards.....	0.914
Kilometers.....	Miles.....	1.609
Square Centimeters.....	Square Inches.....	6.451
Square Meters.....	Square Feet.....	0.093
Square Meters.....	Square Yards.....	0.836
Square Kilometers.....	Square Miles.....	2.590
Square Hectometers.....	Acres.....	0.405
Cubic Meters.....	Cubic Feet.....	0.028
Cubic Meters.....	Cubic Yards.....	0.765
Milliliters.....	Fluid Ounces.....	29.573
Liters.....	Pints.....	0.473
Liters.....	Quarts.....	0.946
Liters-Meters.....	Gallons.....	3.785
Grams.....	Ounces.....	28.349
Kilograms.....	Pounds.....	0.454
Metric Tons.....	Short Tons.....	0.907
Newton-Meters.....	Pound-Feet.....	1.356
Kilo pascals.....	Pounds per Square Inch.....	6.895
Kilometers per Liter.....	Miles per Gallon.....	0.425
Kilometers per Hour.....	Miles per Hour.....	1.609

